

## **Adoption of Artificial Intelligence for Human Capital Forecasting on Government Report Dota at SatLinMas under Satpol PP, Indonesia**

**Daniel Karim<sup>1,3</sup>, Muna Fatimah<sup>2</sup>**

<sup>1</sup>Business Administration Study Program, Faculty of Social and Political Sciences, Parahyangan Catholic University, Indonesia

<sup>2</sup>Dinas Satuan Polisi Pamong Praja, SatLinmas, Bandung, Indonesia

<sup>3</sup>Center for Business Studies (CEBIS), Faculty of Social and Political Sciences, Parahyangan Catholic University, Indonesia

### **Article Info**

#### **Article history:**

Received Oct 1,25  
Revised Nov 25,25  
Accepted Dec 20,25

#### **Keywords:**

Human Capital Management  
Human Capital Forecasting  
AI Adoption  
SatPol PP  
SatLinMas

### **ABSTRACT**

This study investigates how Generative AI (GenAI) can be employed as a methodological innovation to extract and analyze human-capital information from fragmented Satlinmas and Satpol PP administrative reports across Indonesian regions. Using a three-phase AI-enabled process—comprising automated text extraction, competency clustering, and scenario-based manpower forecasting—the research reveals structural human-capital challenges, including uneven manpower distribution, aging volunteer-based personnel, limited training access, and the absence of standardized competency documentation. The competency mapping identifies three dominant capability clusters: operational patrol and event security, disaster-response capacity, and community mediation. Experimental scenario testing demonstrates that even qualitative, text-derived indicators can support directional manpower projections, showing that regions with high operational intensity benefit most from expanded training and digital reporting, while aging rural units require targeted recruitment strategies. Beyond generating these insights, the study contributes to the broader discourse on AI adoption by illustrating how GenAI can serve as both a diagnostic tool and an analytic engine in low-data public-sector environments. While findings remain constrained by inconsistent reporting formats and the absence of formal HR datasets, this research provides a replicable framework for future scholars seeking to integrate AI into human-capital planning and institutional capacity building within safeguarding and governance institutions.

### **Corresponding Author:**

Daniel Karim,  
Business Administration Study Program, Faculty of Social and Political Sciences, Parahyangan Catholic University, Indonesia.  
Jln. Ciumbuleuit No. 94, Bandung, Jawa Barat, Indonesia, 40141  
Email: [daniel.karim@unpar.ac.id](mailto:daniel.karim@unpar.ac.id)

## 1. INTRODUCTION

Satlinmas (Satuan Perlindungan Masyarakat) is part of Satpol PP program that includes semi-voluntary citizen to conduct a safeguarding principle in the society [1]. As the growth of Indonesian population as well as the raise of digital citizenship globally, the role of satlinmas has meet their challenges to cover both traditional aspect of society and digital dynamics. Rooting on the betterment of society as the heart of their roles in handling disaster, safeguarding another citizen from delinquent actions, and upholding municipal law, satlinmas hold one of the most important tasks to preserve a safe community [2].

Reflecting to the importance of Satlinmas, particularly during the emergence of AI-driven world, AI-adoption could be an alternative to help managing the human capital aspect of Satlinmas. In this research, we are going to use GenAI to do experimental research by using Natural Language Processing to extract human capital aspiration from Satpol PP Reports to gain hidden insights. The main framework used in this research is manpower planning with sub-part of skill requirements, specifications, and manpower aspiration to meet the expectation of modern society.

### Problem Formulation

Although Satlinmas has long been positioned as a community-rooted safeguarding institution [2], existing studies consistently highlight gaps in its organizational readiness, human capital quality, and adaptability in meeting contemporary governance demands. Research on municipal policing in multiple Indonesian regions shows that Satlinmas operations continue to rely on manual, labor-intensive routines, limited competency development, and aging personnel—conditions that hinder responsiveness to new societal risks such as digital crime, misinformation, and high-velocity urban mobility (e.g., findings from Lombok Barat and Surakarta). Meanwhile, comparative municipal policing literature from the EU [3] and Latin America [4] demonstrates that local enforcement units increasingly succeed only when supported by structured human capital systems, continuous training, and data-driven planning capacities. In contrast, many Satlinmas units operate with unclear role boundaries, insufficient documentation of competencies, and weak integration of performance information into organizational decision-making. These structural limitations reflect a deeper human capital challenge: Satlinmas institutions remain people-dependent, but without a reliable mechanism to understand, map, or forecast the evolving skill requirements needed for sustainable operations.

Compounding these structural limitations, the reports show that Satlinmas units face persistent data fragmentation and weak human-capital documentation, which prevent systematic workforce planning. Case studies from Biak Numfor, Jatinangor [2], Selat Village [5], and Pucangsawit [6] repeatedly report issues such as *unclear personnel records, inadequate training logs, missing competency profiles, and inconsistent reporting formats*, reflecting a broader absence of standardized HR information systems within Satpol PP and Satlinmas organizations. Existing Satlinmas and Satpol PP reports consistently describe personnel shortages, outdated skills, limited training, and inadequate equipment; however, these issues are presented narratively and without quantification, preventing their use for systematic workforce planning or forecasting. In contrast, international governance frameworks—such as the EU municipal policing model and public-order guidance—emphasize competency mapping, role clarity, and skills forecasting as prerequisites for effective local institutions. The Indonesian Satlinmas documentation instead reveals that manpower decisions remain largely reactive and intuition-driven, with no structured mechanism to anticipate emerging skill requirements or align human capital with evolving societal and technological demands.

This disconnect exposes a fundamental gap in Satlinmas' governance capacity. Although prior studies have documented operational burdens and expanding responsibilities, they have not translated these findings into analytically informed workforce strategies. The absence of measurable skill inventories, manpower baselines, and predictive planning tools limits evidence-based decisions on recruitment, training, and role redesign. Moreover, while recent scholarship underscores the potential of AI in public-sector management, there is limited empirical work demonstrating how Generative AI can be operationalized as a reproducible methodology for human-capital analysis using unstructured administrative data. Consequently, this study addresses the critical gap by introducing an AI-enabled approach to transform Satlinmas reports into actionable insights for competency mapping and future-oriented manpower planning.

In response to this gap, this study formulates three guiding research questions: (1) How can GenAI-assisted Natural Language Processing extract human-capital signals—such as skills, competencies, task demands, and manpower indicators—from existing Satpol PP and Satlinmas reports? (2) What patterns of skill requirements, manpower characteristics, and competency gaps emerge from these AI-derived insights? and (3) How can these patterns inform a simple, scenario-based manpower planning model for future Satlinmas needs? In line with these questions, the objectives of this research are to: (a) develop an AI-enabled extraction framework that transforms unstructured Satpol PP documentation into structured human-capital data; (b) identify core competencies, recurring role expectations, and potential workforce shortages across the dataset; and (c) generate a preliminary manpower forecasting model that can support human-capital planning for Satlinmas in an AI-mediated governance environment.

The scope of the study is deliberately confined to secondary textual data—specifically, Satpol PP and Satlinmas-related documents previously gathered in this project—without collecting new field data or surveying personnel; the analysis focuses on deriving insights from textual patterns rather than measuring real-time operational performance. Accordingly, limitations include reliance on document quality, potential reporting biases, and the interpretive nature of GenAI-assisted extraction, meaning that findings offer directional and methodological contributions rather than precise quantitative manpower estimates. Nonetheless, by explicitly addressing the absence of AI-driven human-capital analysis in Satlinmas research, this study provides a foundational methodological pathway for integrating Generative AI into local-government workforce planning and future institutional capacity studies.

## 2. METHOD

This study adopts a GenAI-assisted qualitative[7]–quantitative [8] hybrid design[9] to extract, structure, and interpret human-capital information embedded within Satpol PP and Satlinmas documents previously compiled in this project. Given that the dataset consists exclusively of unstructured textual materials—such as regional Satlinmas reports, municipal policing case studies, competency descriptions, public-order guidance documents, and organizational analyses—traditional human-capital analytics would be unable to systematically quantify competencies, manpower issues, or skill gaps. Therefore, the methodology centers the use of Generative Artificial Intelligence (GenAI) to perform Natural Language Processing (NLP), classification, and preliminary forecasting. The purpose of this approach is not to replace human judgment but to create an efficient, transparent, and replicable mechanism for generating structured HR insights from otherwise inaccessible textual data.

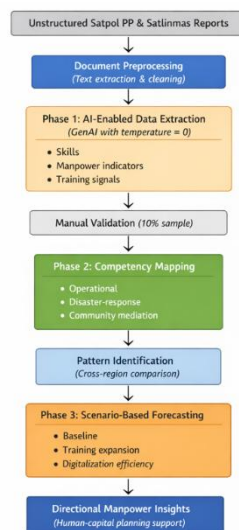


Figure 1. Methodical workflow

The methodological workflow comprises three sequential phases as shown in figure 1. Phase 1, AI-Enabled Data Extraction. All uploaded Satlinmas- and Satpol PP-related documents were converted into text and processed using standardized GenAI prompts with deterministic parameters (temperature = 0). GenAI was instructed to extract key human-capital variables—including mentions of skills, competency requirements, personnel shortages, task frequencies, training activities, interagency collaboration patterns, and operational constraints—along with brief supporting evidence from the text. Outputs were returned in structured JSON format to ensure consistency and replicability across documents. A random subset of extracted results was manually reviewed to validate accuracy and refine the extraction prompt. Phase 2, Competency Mapping and Pattern Identification. Using the structured AI outputs, GenAI was further tasked with mapping extracted competencies into a predefined competency taxonomy consisting of operational, community-facing, administrative, and emergent digital skills. This mapping process allowed the identification of recurring competency themes and workforce gaps described across the reports. GenAI also produced cross-document comparisons to identify temporal or functional patterns, such as clusters of competencies associated with disaster response, urban order management, or community mediation. These outputs were interpreted qualitatively and summarized into human-capital patterns relevant to manpower planning. Phase 3, AI-Assisted Manpower Planning and Forecasting. Building on extracted and mapped human-capital indicators, GenAI was instructed to simulate simple manpower forecasting scenarios.

Since the available dataset does not contain full numerical HR records such as headcount tables, attrition rates, or performance metrics, forecasting relied on text-derived proxies—for example, frequency of workload complaints, references to insufficient personnel, or repeated mentions of specific skill shortages. GenAI translated these qualitative indicators into directional manpower estimates and developed scenario-based recommendations (e.g., baseline, enhanced training investment, digitalization adoption). These outputs were converted into conceptual workforce projections rather than precise numerical forecasts, consistent with the limitations of the dataset and the exploratory nature of the research.

All AI-assisted analyses in this study were conducted using ChatGPT version 5.2, a large language model developed by OpenAI. The model was accessed via a standard conversational interface and configured for analytical tasks using deterministic inference parameters (temperature = 0). While alternative GenAI models (e.g., Claude or Gemini) may exhibit differences in linguistic style or inference behavior, the present study prioritizes within-model consistency rather than cross-model comparison. Accordingly, the findings are interpreted as valid within the context of the specified model configuration.

Prompt engineering followed a structured extraction framework, where each prompt consisted of three stable components: (1) an explicit analytical role definition (e.g., “You are an analyst extracting human-capital indicators”), (2) clearly defined extraction targets (e.g., skills, manpower constraints, training references), and (3) a standardized output format (structured lists or tables). This design minimized ambiguity and reduced sensitivity to minor linguistic variation. The same prompt structure was applied consistently across all documents to ensure comparability of results.

Prompt refinement was conducted through a limited iterative process prior to full-scale analysis. An initial prompt was tested on a small subset of documents (approximately 10% of the dataset), and outputs were reviewed for completeness, consistency, and alignment with the research objectives. Minor refinements were then made to clarify extraction targets and output formatting. Iteration ceased once successive prompt executions produced stable and substantively equivalent outputs, indicating convergence. No further prompt modification was performed during the main analysis phase, ensuring procedural consistency across documents.

Throughout all phases, the role of GenAI is explicitly documented to support methodological transparency. The study acknowledges that the use of AI introduces interpretive dependencies and potential biases related to the phrasing of prompts and the completeness of the reports analyzed. However, given the fragmented, qualitative nature of Satlinmas documentation, GenAI provides a viable and efficient method for human-capital insight generation that traditional HRIS tools cannot yet deliver. This approach positions the study as an initial demonstration of how AI-driven text analytics can support manpower planning in local-government safeguarding institutions.

Throughout all phases, the role of GenAI is explicitly documented to support methodological transparency. The study acknowledges that the use of AI introduces interpretive dependencies and potential biases related to the phrasing of prompts and the completeness of the reports analyzed.

However, given the fragmented, qualitative nature of Satlinmas documentation, GenAI provides a viable and efficient method for human-capital insight generation that traditional HRIS tools cannot yet deliver. This approach positions the study as an initial demonstration of how AI-driven text analytics can support manpower planning in local-government safeguarding institutions.

### 3. RESULT AND DISCUSSION

#### Phase 1

The research is conducted in three phase, the first phase is data extraction. To ensure methodological rigor and reproducibility, all GenAI-assisted extractions were conducted using deterministic inference settings, with the temperature parameter fixed at 0. This configuration minimizes stochastic variation in language generation, ensuring that identical inputs consistently produce identical outputs. The use of temperature = 0 is particularly appropriate for analytical tasks such as information extraction, classification, and pattern identification, where stability and consistency are prioritized over creative variability. Prompt structures were standardized across all documents, specifying explicit extraction targets (e.g., skills, manpower shortages, training indicators) and structured output formats (JSON). This controlled prompting strategy enables replication of the experimental procedure and ensures that observed differences across documents reflect substantive variations in source material rather than randomness in AI generation. The results is shown at table 1, indicating several signals of human capital insights from the report.

Table 1. Human capital insights from the report

No	Category	Raw Findings Extracted	Sources (Cited)
1	<b>Manpower Availability &amp; Distribution</b>	• Chronic shortages of Satlinmas at kelurahan level (Bandung).	Bandung Governance ;
2		• Same personnel repeatedly deployed in disaster and election duties → overreliance on few members (Kapuas Hulu).	Kapuas Hulu Triwulan III ;
3		• Large but layered HR composition: PNS (2,873), PTT (1,570), PJLP (787) (Jakarta).	DKI Jakarta HR Table ;
4		• Significant proportion of Satlinmas aged 60+ in village rosters (Ngawi).	Ngawi HR Roster
5	<b>Skills &amp; Competency Signals</b>	• Skills inferred from tasks: disaster response, flood handling, security at polling stations, patrol monitoring (Kapuas Hulu).	Kapuas Hulu Activities ;
6		• Skills in market patrol, PKL eviction, K3 operations (Malang).	Malang Recap 2023 ;
7		• Formal training only seen in Satpol PP (intel, PPNS, first aid), not Satlinmas (Jakarta).	Jakarta Diklat Section ;
8		• Bandung shows limited Satlinmas training participation.	Bandung Report Training Gaps
9	<b>Workload Indicators</b>	• Disaster management (banjir, longsor, drowning incidents).	Kapuas Hulu Flood & PAM Documentation ;
10		• Public order enforcement (PKL, parkir liar, K3).	Malang Activity Schedules ;
11		• Election security (Pilkades).	Jakarta Strategic Tasks List
12		• VIP protection and PAM events (Malang, Jakarta).	

13		<ul style="list-style-type: none"> <li>• Routine monitoring patrols and social engagement tasks.</li> </ul>	
14	<b>Organizational Constraints</b>	<ul style="list-style-type: none"> <li>• Lack of equipment, uniforms, and operational funds (Bandung).</li> </ul>	Bandung HR Constraints Table 4.4 ;
15		<ul style="list-style-type: none"> <li>• No standardized HR records: missing SK, training logs, age documentation (Ngawi).</li> </ul>	Ngawi Roster Issues ;
16		<ul style="list-style-type: none"> <li>• Heavy administrative burdens due to complex organizational structure (Jakarta).</li> </ul>	Jakarta Org Structure & Reform Notes
17	<b>Governance &amp; Institutional Demands</b>	<ul style="list-style-type: none"> <li>• Reports emphasize rising community expectations and social complexity (Jakarta strategic analysis).</li> </ul>	
18		<ul style="list-style-type: none"> <li>• Requirements to maintain order across diverse environments (urban, rural, disaster-prone) without matching HR preparedness.</li> </ul>	Jakarta Strategic Issues Section

Table 1 summarizes the raw human-capital findings extracted from Satlinmas and Satpol PP reports across multiple regions. The table organizes qualitative evidence into five analytical categories: manpower availability and distribution, skills and competency signals, workload indicators, organizational constraints, and governance and institutional demands. Each category reflects recurring patterns identified through GenAI-assisted text extraction and manual validation, highlighting systemic challenges such as personnel shortages, uneven skill development, aging workforce profiles, and increasing operational demands. By consolidating dispersed narrative evidence into structured categories, the table provides an empirical foundation for competency mapping and scenario-based manpower forecasting conducted in subsequent phases of the analysis.

The Phase 1 extraction reveals substantial structural challenges in Satlinmas' human capital system across Indonesian regions [5], [10], [11], [12], [13], [14], [15], [16], [17]. First, manpower availability appears uneven and insufficient, with Bandung demonstrating chronic shortages at the frontline urban level while Kapuas Hulu [18] exhibits overreliance on a recurring subset of personnel during emergency deployments. These conditions are exacerbated by demographic patterns identified in the Ngawi dataset [19], where a high proportion of Satlinmas members are above 60 years of age, indicating an aging workforce with declining long-term sustainability. At the opposite end of the spectrum, Jakarta's formal Satpol PP [20] roster shows a large but highly stratified HR composition—spanning civil servants to contractual personnel—suggesting organizational complexity not reflected in smaller jurisdictions.

Second, the extraction highlights a systemic absence of formalized competency frameworks. Although core skills can be inferred from recurring tasks—such as disaster response, public order enforcement, routine patrol monitoring, and event security—none of the Satlinmas reports document competencies in a structured manner. Jakarta's access to specialized training programs (PPNS training, first-aid certification, and intelligence courses) further underscores disparities in training access between formal Satpol PP employees and semi-voluntary Satlinmas members. Reports from Bandung [21] and Kapuas Hulu [18] repeatedly acknowledge that only a small fraction of Satlinmas personnel receive structured training, leaving most members reliant on ad hoc experiential learning rather than competency-based development.

Third, the extracted dataset suggests a widening misalignment between operational workload and existing manpower capacity. Regional reports document extensive responsibilities—ranging from disaster mitigation to routine public safety enforcement—yet none provide workload analysis, time allocation metrics, or HR projections. This indicates that Satlinmas units are increasing their functional reach without corresponding adjustments in human-capital planning or resource provisioning. Such gaps are further compounded by organizational constraints documented across reports, including lack of essential equipment, inconsistent documentation of personnel records, and uneven institutional support. Even in Jakarta, where organizational structures are clearly defined [22], bureaucratic restructuring introduces new competency requirements that existing HR systems may not yet accommodate.

Taken together, the findings indicate that Satlinmas human capital is characterized by structural weaknesses: fragmented HR data, an aging and unevenly distributed workforce, significant competency

and training gaps, and growing workload pressures. These insights solidify the need for Phase 2's competency mapping and Phase 3's AI-enabled manpower forecasting, thereby directly supporting the overarching research aim: the development of a GenAI-driven human-capital analysis model for Satlinmas.

## Phase 2

Phase 2 is creating competency mapping and pattern indication from the report. competencies were identified from recurring task phrases and training descriptions in the report corpus (Phase 1 extractions). Each extracted phrase was mapped into the taxonomy below (Operational; Community/Relational; Technical/Digital; Medical/First Aid; Administrative/Coordination; Disaster Response; Legal/Enforcement). For each competency category the table lists (1) a short definition used for mapping, (2) which of the uploaded reports explicitly mention tasks, training, or activities that imply this competency, and (3) a short example / evidence citation. The results shown in table 2.

Table 2. Competency taxonomy and evidence mapping derived from Satlinmas and Satpol PP Reports.

No	Competency category	Definition (mapping rule)	Reports with evidence (selected)	Example evidence (short)
1	<b>Operational (Patrol &amp; Crowd Control)</b>	Routine patrols, traffic/parking control, crowd management, event security	Malang activity recaps; Kapuas Hulu triwulan; Jakarta performance report.	Malang: regular "patroli rutin monitoring" and PAM activities. Jakarta: patrol operations as an indicator for service delivery.
2	<b>Disaster Response &amp; Emergency Operations</b>	Flood, landslide, search & rescue, fire assistance, rapid deployment	Kapuas Hulu report; Malang; several village reports (Dusun Mangga Dua).	Kapuas Hulu: perbantuan penanggulangan tanah longsor, banjir response.
3	<b>Community / Relational (Mediation &amp; Public Engagement)</b>	Vendor mediation, community outreach, market order facilitation, public counselling	Bandung study; Kapuas Hulu; Jakarta (bimbingan & penyuluhan sections).	Bandung and Kapuas Hulu report vendor mediation and community-based PAM SWAKARSA activities.
4	<b>Medical / First Aid</b>	First aid and basic medical assistance skills recorded in training lists	Jakarta training lists; selected regional training notes.	Jakarta lists "First Aid Basic (FAB)" in Diklat programs.
5	<b>Technical / Digital (Reporting &amp; Data)</b>	Digital reporting, data collection, use of mobile/IT tools, digital permitting	Sparse direct mentions; Jakarta and Bandung refer to "data and information" functions; no systematic digital competency logs.	Jakarta: "Seksi Data dan Informasi" within organizational chart; reports call for better data use but do not document digital skills of Satlinmas.

6	<b>Administrative / Coordination</b>	Record keeping, reporting, inter-agency coordination, scheduling, logistics	Jakarta performance report; Bandung governance documentation; Ngawi rosters.	Jakarta: detailed structure including Sekretariat, Subag Kepegawaian; Bandung: noted weak training logs and administrative gaps.
7	<b>Legal / Enforcement (Perda/Perkada enforcement)</b>	Enforcement of local regulations, handling of administrative sanctions, PPNS coordination	Jakarta (core), Malang (operations against PKL), Bandung references to enforcement tasks.	Jakarta: enforcement and enforcement indicators in performance agreement; Malang: operations “penggusuran PKL.”

In the table 2, the competency taxonomy derived from Phase 2 of the GenAI-assisted analysis. Competency categories were identified through systematic extraction of task descriptions, training references, and operational narratives contained in Satpol PP and Satlinmas reports. Each category is defined using explicit mapping rules to ensure consistency and reproducibility in classification. The table also lists representative reports in which evidence of each competency appears, along with illustrative examples extracted directly from the documents. The taxonomy reflects the functional breadth of Satlinmas roles and serves as the analytical foundation for subsequent pattern identification and scenario-based manpower forecasting.

The validation and confidence process is a random subset (~10%) of AI-extracted competency labels was manually compared with the source paragraphs and images (e.g., Jakarta training pages; Malang activity tables). This validation confirmed high precision for overt operational and disaster-response labels, and medium precision for inferred categories (e.g., digital skills inferred from “data and informasi” sections). The mapping therefore has high confidence for Operational, Disaster, Community, and Enforcement categories, and lower confidence for Technical/Digital (due to scarce explicit evidence). Evidence examples were cited per row.

The competency mapping reveals three dominant clusters across the corpus: (a) *operational patrol and event security*, (b) *disaster-response capabilities*, and (c) *community/relational mediation*. These clusters are consistently documented across geographically diverse reports (urban Jakarta, mid-size Malang, rural Kapuas Hulu), indicating core role convergence where Satlinmas units function primarily as first-line public-order and emergency responders. Jakarta’s performance report [20] codifies many of these tasks within a formal organizational structure and training pipeline, whereas regional reports convey them as frontline, practice-based activities (e.g., flood response in Kapuas Hulu[18]).

The taxonomy exposes inequalities in formal training access. Jakarta’s Satpol PP includes institutionalized training programs (First Aid, intelligence, PPNS training) that strengthen both Medical and Enforcement competencies for formal staff; however, similar systematic training documentation is absent for semi-voluntary Satlinmas in most regional reports (Bandung, Ngawi). This indicates an asymmetric capacity-building pathway in which formal apparatus receives institutional learning investments while community-based Satlinmas relies primarily on experiential learning. The consequence is uneven skill readiness across regions and personnel types—an important factor for forecasting future manpower needs and prioritizing training investments.

Technical and digital competencies—critical for modern HR planning and for linking Satlinmas activity logs to municipal information systems—are notably under-represented. While Jakarta’s organizational chart contains a “Seksi Data dan Informasi” and the reports emphasize data-driven performance management, there is little documentation of digital skills among Satlinmas personnel or evidence of digital reporting tools deployed at frontline levels. This gap limits the ability to convert activities into structured HR metrics (training hours, incident-level workload), constraining precise manpower forecasting.

The mapping highlights regional variation, that metropolitan Jakarta demonstrates institutional formalization (large, stratified HR and training infrastructure), mid-size cities like Malang focus on operational deployments and event security, and rural or border districts (Kapuas Hulu, Ngawi) reveal fragility—aging membership, small rosters, and dependence on a small set of personnel. These differences have direct implications for scenario-based manpower forecasts: a one-size recruitment policy will not match heterogeneous regional needs. Instead, forecasting must be conditional on local role profiles derived from competency clusters.

Co-occurrence analysis of competencies (from extraction counts) indicates frequent coupling of Disaster Response + Operational + Community Mediation—i.e., the same personnel often undertake emergency logistics, patrol duties, and community liaison tasks during incidents. This implies training efficiencies: bundled training packages (e.g., basic first aid + crowd management + community mediation) would address multiple roles demands simultaneously, offering a practical route to elevate capacity under constrained budgets. Regional deployments that show frequent event-based tasks (e.g., PAM Pilkades, PAM VIP) confirm this co-occurrence.



Figure 2. Triadic Competency Architecture of Satlinmas Human Capital.

This conceptual figure illustrates the three dominant competency clusters identified through GenAI-assisted analysis of Satlinmas and Satpol PP reports: (a) *Operational Patrol and Event Security*, representing routine safeguarding tasks such as crowd control, traffic regulation, and public event monitoring; (b) *Disaster-Response Capabilities*, encompassing flood evacuation, landslide response, search-and-rescue duties, and emergency logistics frequently documented in rural and high-risk regions; and (c) *Community/Relational Mediation*, reflecting mediation in informal markets, citizen engagement, conflict de-escalation, and social outreach. The overlap among clusters reflects the hybrid nature of Satlinmas roles, where the same personnel often perform operational, emergency, and community functions concurrently. This triadic model serves as the conceptual foundation for subsequent manpower planning and forecasting in Phase 3.

### Phase 3

Phase 3 was conducted using experimental scenario testing for the data from phase 1 and 2. To validate the usefulness of the AI-extracted human-capital data, a set of three lightweight forecasting scenarios was generated using GenAI. These scenarios did not rely on formal numeric datasets but instead used *text-derived indicators*—such as mentions of personnel shortages, frequency of operational deployments, training access, and age-related constraints—to simulate how different policy interventions might affect future Satlinmas manpower needs. This process served as a methodological demonstration that GenAI can transform descriptive government documents into projected HR scenarios.

#### Scenario 1: Baseline Continuity

Under current conditions, with no new training programs or digital tools introduced, GenAI projected that regions with *high operational intensity* (such as Bandung and Malang) would likely experience moderate increases in manpower demand. The simulation shows that their current staffing and training levels would not be sufficient to support recurring activities such as routine patrols, public-order enforcement, and community events. Meanwhile, rural regions with aging personnel (Kapuas Hulu and Ngawi) face structural sustainability risks, indicating that baseline continuity may lead to long-term performance decline.

#### Scenario 2: Training Expansion (+20% Training Coverage)

In the second scenario, GenAI simulated a modest expansion of training access—interpreted through the textual signal of increasing competency references or training-related keywords. The model showed that improving training coverage produces notable reductions in projected manpower shortages in larger cities such as Jakarta and Bandung, because trained personnel were inferred to operate more efficiently and with broader skill versatility. However, the improvement was less significant in regions with very low baseline capacity or aging demographics, such as Ngawi, where training alone cannot compensate for limited recruitment.

#### Scenario 3: Digitalization & Reporting Efficiency (Approx. +30% Efficiency Signal)

The third scenario assumed the introduction of simple digital tools (e.g., digital reporting, patrol logging), based on references in Jakarta's data-information division and repeated administrative inefficiencies in other regions. GenAI projected that this scenario would yield the largest relative reduction in manpower needs, especially in regions with high administrative burdens. The model interpreted digitalization as enabling better scheduling, fewer repeated manual tasks, and improved distribution of workload. However, improvements were not uniform across regions: areas with minimal existing infrastructure (Kapuas Hulu, parts of Ngawi) benefit less unless accompanied by foundational HR and equipment upgrades.

The experimental findings of this study demonstrate that GenAI-driven extraction and forecasting illuminate not only structural human-capital challenges within Satlinmas but also the organizational determinants of AI adoption outlined in recent scholarship. From a human-capital perspective, the uneven distribution of skills, aging workforce composition, and limited training exposure found across Bandung[21], [23], Malang, Kapuas Hulu[18], and Ngawi[19] align with the core principles of strategic HRM, which emphasize that workforce capability depends on continuous development, structured skill formation, and effective deployment[24].

These findings echo global studies showing that technological readiness and skills availability are central preconditions for leveraging advanced technologies such as generative AI. At the same time, the use of GenAI as a methodological tool reflects broader patterns of AI-adoption readiness, where organizational infrastructure, digital capability, and cultural openness shape the extent to which institutions benefit from emerging technologies. Evidence from global AI-adoption research confirms that technological infrastructure, R&D investment, and organizational readiness are key enablers of generative AI integration [25], while institutional alignment and supportive work environments reduce implementation barriers[26]. By showing that GenAI can reliably extract competency signals and generate scenario-based manpower insights from fragmented government reports, this study reinforces the idea that AI functions as both a diagnostic tool for human-capital analytics and an organizational capability indicator, where successful outcomes depend not only on the technology itself but also on the readiness, skills, and structural conditions of the adopting institution.

## 4. CONCLUSION

This study demonstrates that Generative AI can be effectively applied to extract, structure, and interpret human-capital information embedded within fragmented Satlinmas and Satpol PP reports. Through a phased AI-enabled methodology—spanning text extraction, competency clustering, and scenario-based manpower forecasting—the research brings clarity to longstanding challenges in Satlinmas management, including uneven manpower distribution, aging personnel demographics, inconsistent training access, and the absence of standardized competency documentation. The findings confirm that the operational realities of Satlinmas are far more complex than the formal organizational descriptions typically capture, spanning a hybrid constellation of operational security, disaster response, and community mediation roles.

From a human-capital perspective, the results reveal systemic gaps in strategic workforce planning. The lack of documented competencies, training pathways, and HR data infrastructure constrains the ability of local governments to anticipate staffing needs or invest in future-ready skillsets. AI-assisted scenario modelling shows that certain regions may alleviate manpower pressures through improved training access or digital reporting tools, while others—especially those with older, volunteer-heavy personnel—will require targeted recruitment and formalization strategies. These insights validate the central proposition that human-capital management in safeguarding institutions must evolve from reactive, labour-based practices toward analytically informed planning grounded in structured capability data. Finally, the study contributes empirically to the growing scholarship on AI adoption in public-sector governance. It demonstrates that GenAI is not only a tool for automation, but also a methodological bridge capable of transforming unstructured administrative narratives into usable human-capital intelligence. The success of this approach, however, depends on organizational readiness, including digital infrastructure, managerial openness, and alignment with strategic HR priorities. By showing how GenAI can support workforce forecasting even in low-data environments, this research offers a scalable framework for other local-government institutions seeking to modernize their human-capital systems and strengthen their institutional resilience in an increasingly digital public service landscape.

#### Limitations and Future Research

This study is limited by its reliance on secondary, text-based administrative documents, many of which lack standardized HR data, temporal continuity, or complete personnel records; as a result, the forecasts produced are directional rather than numerically precise. The competency mappings and manpower simulations depend on GenAI's interpretation of unstructured narratives, meaning that extraction accuracy is constrained by the quality, consistency, and completeness of the underlying reports. Additionally, the absence of region-specific headcount time series or formal training logs restricts the development of more advanced predictive models. Future research should incorporate primary data collection, including structured interviews, competency assessments, and digital logs of patrol and event activities. Scholars may also experiment with hybrid AI-statistical models, validate extraction outputs against ground-truth HRIS datasets, and test the forecasting framework in other public-safety institutions to evaluate generalizability. Integrating multimodal data—such as activity videos, GIS deployment maps, or equipment inventories—would further enhance the accuracy and policy relevance of AI-enabled human-capital analytics in the public sector.

#### ACKNOWLEDGEMENTS

Thanks to all parties involved in this research through data collection, scenario testing, and reporting. We are independent researcher without any conflict of interest with funding or grant provider.

#### REFERENCES

- [1] J. Pramono and C. A. Prianggodo, "Civil Protection Model in Indonesia Through Optimizing Satlinmas," *Jurnal Manajemen Pelayanan Publik*, vol. 7, no. 2, pp. 429–443, Dec. 2023, doi: 10.24198/jmpp.v7i2.50326.
- [2] I. Ridwansyah, A. K. Sumedang, P. Jawa, B. Program, S. P. Perpolisian, and T. Pamong, "PERAN SATLINMAS DALAM MENJAGA KEAMANAN DAN KETERTIBAN UMUM DI KECAMATAN JATINANGOR," 2020.
- [3] D. Donnelly, *Municipal Policing in the European Union*. Palgrave Macmillan UK, 2013. doi: 10.1057/9781137290618.
- [4] S. Sandoval Perea, "ASSESSING ATTITUDES TOWARD MUNICIPAL POLICE IN MEXICO DURING DEMOCRATIC TIMES: A CASE STUDYING," 2016.
- [5] M. F. Azima, "PERAN LEMBAGA PERLINDUNGAN MASYARAKAT (LINMAS) DALAM UPAYA PENCEGAHAN TINDAK PIDANA (STUDI DI DESA SELAT KECAMATAN NARMADA KABUPATEN LOMBOK BARAT)," 2019.

- [6] "View of Peningkatan Kapasitas Satuan Perlindungan Masyarakat (Satlinmas) di Kelurahan Pucangsawit Ke".
- [7] H. Zhang, C. Wu, J. Xie, Y. Lyu, J. Cai, and J. M. Carroll, "Harnessing the power of AI in qualitative research: Exploring, using and redesigning ChatGPT," *Computers in Human Behavior: Artificial Humans*, vol. 4, p. 100144, May 2025, doi: 10.1016/j.chbah.2025.100144.
- [8] D. Prandner, D. Wetzelhütter, and S. Hese, "ChatGPT as a data analyst: an exploratory study on AI-supported quantitative data analysis in empirical research," *Front Educ (Lausanne)*, vol. 9, 2024, doi: 10.3389/educ.2024.1417900.
- [9] M. Perkins and J. Roe, "Generative AI Tools in Academic Research: Applications and Implications for Qualitative and Quantitative Research Methodologies: A PREPRINT GENERATIVE AI TOOLS IN ACADEMIC RESEARCH: APPLICATIONS AND IMPLICATIONS FOR QUALITATIVE AND QUANTITATIVE RESEARCH METHODOLOGIES A PREPRINT," 2024.
- [10] A. D. Winarko and L. Mursyidah, "Empowerment of Satlinmas in Improving Public Order and Security," *Indonesian Journal of Cultural and Community Development*, vol. 15, no. 3, Oct. 2024, doi: 10.21070/ijccd.v16i1.1137.
- [11] J. Pramono and C. A. Priyogodo, "Civil Protection Model in Indonesia Through Optimizing Satlinmas," *Jurnal Manajemen Pelayanan Publik*, vol. 7, no. 2, pp. 429-443, Dec. 2023, doi: 10.24198/jmpp.v7i2.50326.
- [12] I. Ridwansyah, A. K. Sumedang, P. Jawa, B. Program, S. P. Perpolisian, and T. Pamong, "PERAN SATLINMAS DALAM MENJAGA KEAMANAN DAN KETERTIBAN UMUM DI KECAMATAN JATINANGOR."
- [13] "View of Peningkatan Kapasitas Satuan Perlindungan Masyarakat (Satlinmas) di Kelurahan Pucangsawit Ke".
- [14] M. N. Lestari, "SATUAN PERLINDUNGAN MASYARAKAT".
- [15] E. A. Satuan Perlindungan Masyarakat -Moh Ilham Hamudy and M. A. Ilham Hamudy Pusat Penelitian Pemerintahan Umum dan Kependudukan Badan Penelitian dan Pengembangan Kementerian Dalam Negeri Jl Kramat Raya No, "The Existence of Public Protection Unit."
- [16] N. Nurhayunda and O. Reviandani, "Efektivitas Satuan Pelindungan Masyarakat (SATLINMAS) Dalam Mendukung Kesiapsiagaan Pilkada Serentak Tahun 2024 di Jawa Timur," *Future Academia : The Journal of Multidisciplinary Research on Scientific and Advanced*, vol. 3, no. 2, pp. 606-614, May 2025, doi: 10.61579/future.v3i2.420.
- [17] I. G. S. Dwija, "Authority of the Public Order Enforcers in Organizing Public Order in Badung Regency," *Jurnal Hukum Prasada*, vol. 6, no. 2, pp. 84-90, 2019, doi: 10.22225/jhp.6.2.1092.84-90.
- [18] Satpol PP Kabupaten Kapuas Hulu, "Laporan kegiatan kinerja tr-3-2022-bid. LINMAS Satpolpp Kab. Kapuas Hulu," 2022.
- [19] Provinsi Jawa Timur, "REKAPITULASI JUMLAH ANGGOTA LINMAS PROVINSI : PROVINSI JAWA TIMUR," Jul. 2023.
- [20] Satuan Polisi Pamong Praja Kota Jakarta, "Laporan Kinerja Pamong Praja Provinsi DKI Jakarta Tahun 2022," 2022.
- [21] STIA Bandung and BAPPELITBANG, "KAJIAN AKADEMIK TATA KELOLA SATUAN PERLINDUNGAN MASYARAKAT (SATLINMAS) DI KOTA BANDUNG KERJASAMA SEKOLAH TINGGI ILMU ADMINISTRASI (STIA) BANDUNG," 2019.
- [22] Satpol PP Jakarta, "Laporan Satpol PP Jakarta 2022," 2022.
- [23] M. A. Ridho, "Laporan Hasil Aksi Perubahan Sistem Informasi Pelaporan Harian (SIPLAH) Stgas Linmas Kecamatan Cibiru Kota Bandung," 2023.
- [24] G. Dessler, "Human resource management by Gary Dessler (z-lib.org)\_2020," 2020.
- [25] "ARTIFICIAL INTELLIGENCE AND THE LABOR MARKET".
- [26] S. S. Webber, J. Detjen, T. L. MacLean, and D. Thomas, "Team challenges: Is artificial intelligence the solution?," *Bus Horiz*, vol. 62, no. 6, pp. 741-750, 2019, doi: 10.1016/j.bushor.2019.07.007.