

NAVIGATING THE AI-DRIVEN TRANSFORMATION OF EMPLOYMENT RELATIONS IN SABAH PUBLIC SECTOR: A PRELIMINARY STUDY

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Abstract. Artificial intelligence (AI) is rapidly reshaping public sector employment relations globally, yet evidence from subnational jurisdictions within developing federations remains limited. Sabah, Malaysia, has embarked on an ambitious digital transformation agenda that includes integrating AI into civil service. However, the nature and extent of AI's impact on employment relations, particularly management authority, employee voice, and workplace governance, have not been systematically examined. This preliminary scoping review synthesises available evidence on how AI adoption is transforming employment relations in Sabah's public sector and identifies the main challenges, opportunities, and strategic adaptation pathways reported in the literature. Studies and credible grey literature published in English or Malay between 1 January 2020 and 1 May 2026 were included if they addressed AI deployment and workforce or employment relations implications within Sabah's public sector. Documents focusing solely on technical AI architecture without workforce implications were excluded. Scopus, Web of Science, Google Scholar, Malaysian institutional repositories, and government portals were systematically searched. A customised extraction form recorded bibliographic details, study context, AI technologies, employment relations dimensions, and key qualitative findings. Data were synthesised using Braun and Clarke's reflexive thematic analysis. Seventeen sources met the inclusion criteria. Three overarching themes were developed: (1) AI-Induced Reconfiguration of Public Service Work Design, encompassing job displacement concerns, task augmentation, and emerging competency requirements; (2) Algorithmic Governance and the Shifting Employment Relationship, including algorithmic management, procedural justice concerns, and technostress; and (3) Strategic Adaptation Through Institutional Capacity Building, covering training initiatives, social dialogue, and policy responses. AI transformation in Sabah's public sector remains nascent and fragmented, with substantial evidence gaps concerning collective bargaining, trade union engagement, and equity outcomes. The findings highlight the need to embed social dialogue and workforce participation within Sabah's digital transformation agenda to ensure that AI-driven modernisation strengthens rather than weakens public sector employment relations.

Keywords: *artificial intelligence, employment relations, public sector, Sabah, scoping review, reflexive thematic analysis*

Introduction

Artificial intelligence (AI) has moved from speculative discourse to operational reality across public administrations worldwide. Governments increasingly deploy machine learning algorithms, natural language processing tools, and generative AI platforms to streamline recruitment, automate case handling, monitor performance, and support policy decisions (Bian et al., 2025; OECD, 2025). These interventions do not merely alter technical workflows; they fundamentally reconfigure the relational architecture of public sector employment authority structures, worker autonomy, accountability lines, and the psychological contract between employee and employer (Pieroni and Rossello Roig, 2026; Chilunjika et al., 2022). The scholarly response has been vigorous. Systematic reviews have mapped AI's influence on public sector human

resource management globally (Bian et al., 2025), on performance governance in local government (Maake and Schultz, 2025), and on algorithmic management in European public services (Riso et al., 2025). Yet these syntheses converge on a striking lacuna: the evidence base derives overwhelmingly from high-income, western contexts the United States, Western Europe, and selects East Asian economies. How AI transforms employment relations in the public sectors of developing and middle-income countries, and particularly in subnational jurisdictions within federal systems, remains profoundly under-researched.

Sabah, Malaysia's second-largest state on the island of Borneo, presents an analytically strategic case. The state government has committed to ambitious digital transformation under the Sabah Maju Jaya (SMJ) development plan and the Sabah Digital Government Innovation (SDGI) master plan. Tangible AI initiatives are underway: Sabah became the first Malaysian state to deploy Google Workspace Gemini across its administration (Daily Express, 2025b); the federal Ministry of Digital and Universiti Malaysia Sabah have conducted AI literacy surveys among state civil servants, reporting a readiness index of 3.56 out of 5; and the Sabah State Public Service Commission (SPANS) has highlighted AI and digital skills as prerequisites for public sector employment (The Borneo Post, 2025). Simultaneously, tensions are emerging: the federal Public Service Department has announced a formal assessment of AI's impact on civil service positions (The Sun, 2026); World Bank analysis identifies talent shortages and resistance to change as binding constraints on Malaysia's digitisation (Zahiid, 2025); and early evidence of technostress among Malaysian public servants has been documented (Abdullah et al., 2025).

The available literature on AI and Sabah's public sector is heterogeneous in design, interdisciplinary origin, and publication format. It spans government policy statements, news reports, institutional surveys, academic articles, and international agency assessments. No systematic effort has been made to gather, chart, and synthesise this dispersed evidence base. A scoping review is therefore the academically appropriate approach: it permits mapping of a diverse body of literature without prematurely excluding studies on methodological grounds, identifying the volume, nature, and characteristics of available evidence, and clarifying conceptual boundaries for subsequent primary research (Peters et al., 2020; Arksey and O'Malley, 2005). Within the context of the Sabah public sector, where scholarship at the intersection of artificial intelligence and employment relations transformation remains nascent, this methodological synergy is highly justified. It systematically delineates established knowledge while simultaneously illuminating critical theoretical and empirical lacunae. Executing this inquiry through a framework that is methodologically transparent, fundamentally replicable in its search strategy, and interpretively accountable in its synthesis robustly justifies its selection as the primary investigative method for this study.

Objectives and research questions

This scoping review is guided by the Population-Concept-Context (PCC) framework. The Population is Sabah public sector employees and the institutions that employ them; the Concept encompasses the intersection of artificial intelligence deployment with employment relations defined broadly to include work design, management authority, employee voice, job quality, skill demands, and the institutional arrangements governing the employment relationship; and the Context is the Sabah state public

administration within Malaysia's federal governance structure. The primary research question is particularly on how does artificial intelligence adoption transform employment relations in the Sabah public sector, and what challenges, opportunities, and strategic adaptation pathways are evident in the existing evidence base? Two subsidiary questions guide the synthesis: (1) What patterns of shared meaning characterise the reported challenges and opportunities associated with AI integration into Sabah's public sector workforce? (2) What strategic adaptation measures have been proposed, initiated, or documented to manage the employment relations implications of AI in this context?

Literature review

AI in public sector human resource management

A rapidly expanding corpus examines AI's penetration of public sector HR functions. Bian et al. (2025), in a PRISMA-guided systematic review of 47 peer-reviewed articles from 2019–2023, identified five thematic clusters: ethical and governance models; AI's influence on HR functions and organisational behaviour; implementation barriers and benefits; digital governance and policy formulation; and big data-driven HR innovations. Their synthesis highlights data infrastructure, structured training, and ethical standards as critical success factors, while data privacy, algorithmic bias, and workforce adaptation constitute persistent challenges. Chilunjika et al. (2022) explored the South African case specifically, finding that AI could reduce bias in recruitment and free HR personnel for strategic functions, but simultaneously posed threats to white-collar employment. The OECD (2025) policy brief on AI in civil service reform emphasises AI's potential to personalise HR services, accelerate processes, and boost productivity, while cautioning that "fears that the use of AI changes the employment relationship in a way that blurs accountabilities of decisions" require institutional attention (OECD, 2023). A parallel literature on algorithmic management in the public sector examines how automated systems increasingly direct, evaluate, and discipline workers. The PSFWF (2025) guidance on algorithmic management defines such systems as "any system using computer processes to take or support employment decisions," encompassing automation, machine learning, statistics, and AI. Studies of algorithmic profiling in public employment services reveal tensions between efficiency gains and procedural justice for both caseworkers and jobseekers (Sirman-Winkler et al., 2024). A randomised controlled trial in a Danish unemployment insurance context found that implementing algorithmic decision-support tools increased employee cynicism toward change and change fatigue, raising fundamental questions about workforce well-being under AI-augmented management (Döring et al., 2024).

Employment relations as an analytical lens

Employment relations scholarship examines the formal and informal rules, processes, and power dynamics that govern the workplace relationship between employers, workers, and their representatives. The field's core concerns job quality; voice mechanisms, procedural fairness, skill formation, and the distribution of productivity gains provide a robust framework for interrogating AI's workforce implications beyond narrow efficiency metrics. The OECD Employment Outlook (2023) devoted a chapter to social dialogue and collective bargaining in the age of AI, concluding that union and worker involvement in technology adoption decisions is associated with better outcomes

for both productivity and job quality. Trade union federations have become increasingly assertive on this agenda: the Trades Union Congress (2025) established a dedicated working group on AI and digitalisation in the public sector, and UNISON (2026) has called for a statutory duty on public sector employers to consult unions before introducing high-risk AI systems. Yet the empirical base for these advocacy positions remains thin and almost entirely concentrated in high-income countries with strong collective bargaining traditions.

The Malaysian and Sabah context: Connecting macro-level drivers to local structures

Malaysia's engagement with AI is unfolding within a distinctive institutional architecture. The federal civil service numbers approximately 1.62 million personnel, and while downsizing remains politically sensitive, digitisation is positioned as the preferred pathway to efficiency improvement. The federal government launched the AI at Work 2.0 programme, collaboration between the Ministry of Digital, the National AI Office, and Google Cloud aiming to train 445,000 civil servants in generative AI tools (Bhatia and Alagaratnam, 2026). Early data indicate 97 per cent of participating civil servants save an average of 3.25 hours per week, with 91 per cent reporting improved work quality (Bhatia and Alagaratnam, 2026). The MyMahir Impact Study projects that 620,000 jobs, 18 per cent of Malaysia's formal sector, will be significantly affected by AI within three to five years (TalentCorp, 2025). The federal Public Service Department has simultaneously initiated a formal study to assess AI's impact on civil service positions, with the Director-General emphasising that "AI is already capable of taking over routine and analytical tasks" and calling for job description reviews to ensure ongoing relevance (The Sun, 2026).

Sabah operates within this national framework but possesses distinct structural features that mediate AI's employment relations impact. As a Bornean state with a population of approximately 3.9 million, Sabah has historically experienced lower levels of digital infrastructure investment, higher rural-urban digital divides, and a public sector that serves as a primary formal employer. The state's civil service numbers approximately 20,303 personnel, with women holding 34.55 per cent of positions and 43.84 per cent of managerial and professional roles. The Sabah Digital Government Innovation (SDGI) master plan anchors the state's digital agenda, and the Sabah Public Service Human Resource Training Policy (DLSM) introduced alongside an integrated human resource management system signals institutional intent toward workforce modernisation (Daily Express, 2025a). However, macro-level geopolitical and technological drivers intersect with local structures in complex ways. Sabah is a technology adopter rather than a developer; its AI tools are predominantly foreign-made platforms (Google, Microsoft) that embed assumptions from their jurisdictions of origin. The digital literacy divide, documented in World Bank assessments showing nearly half of Malaysian ministries reporting difficulties hiring staff with digital competencies, is likely amplified in Sabah given infrastructure constraints (Zahiid, 2025). The absence of specific AI employment legislation at either federal or state level creates a regulatory vacuum that shifts the burden of adaptation onto individual workers and departments.

These structural conditions make Sabah more than a decorative case illustration. The state's experience provides an analytically fertile site for examining how AI-driven employment relations transformation unfolds in a subnational jurisdiction within a developing federation where global technological imperatives encounter local institutional capacities, labour market structures, and governance traditions. The present

scoping review contributes to theory by testing whether frameworks developed in high-income contexts adequately capture the dynamics observed in Sabah, and by extending understanding of the mechanisms through which macro-level AI drivers are refracted through subnational institutional arrangements.

Employment relations, as operationalised in this review, encompasses the formal and informal rules, processes, and institutional arrangements that govern the tripartite relationship between workers, management, and the state in the sphere of public service employment. Drawing on established industrial relations scholarship, this definition includes, but is not limited to, work design and job quality, management authority structures, employee voice and participation mechanisms, procedural justice in human resource decisions, skills formation and competency frameworks, and the collective bargaining and social dialogue arrangements that mediate the distribution of power and resources within the workplace. The review's PCC framework, population (Sabah public sector employees), concept (AI deployment and its intersection with employment relations), and context (the Sabah state administration within Malaysia's federal governance architecture), was purposefully constructed to capture each of these dimensions as they appear in the published evidence base.

The Malaysian public sector possesses a mature, albeit distinctive, employment relations architecture that provides the institutional scaffolding for this inquiry. At the apex of this architecture sits the National Joint Council (Majlis Bersama Kebangsaan, MBK), established in 1973 and most recently revised through Service Circular Number 6 of 2020, which came into effect on 1 January 2021. The MBK is formally defined by the Public Service Department as "an official platform for employer-employee relations in the Public Service... involving Officers and Employees to discuss matters included in its jurisdiction" (JPAM, 2024). Its statutory functions include giving opinions and discussing principles on remuneration, allowances, facilities, and terms of service for public sector employees; enabling officers to suggest changes and gather comments from employees before presentation to the government for decision; and making recommendations on innovation and productivity initiatives for improving the public service productivity system. The MBK structure explicitly incorporates trade union officers as permanent members, embedding worker representation within the formal machinery of public employment governance (JPAM, 2024).

Complementing the MBK at the institutional level is the Departmental Joint Council (Majlis Bersama Jabatan, MBJ), which functions as a structured forum for two-way communication between employees and administration within individual government departments and statutory bodies. Universiti Kebangsaan Malaysia's (UKM) employment practice framework describes the MBJ as "a pivotal platform for facilitating effective two-way communication between employees and the administration... a structured forum where employees can voice their concerns, share their opinions, and contribute ideas to improve the organisation". The MBJ's role in ensuring that "employees' views are heard and considered, fostering a collaborative environment for decision-making" establishes an institutionalised employee voice mechanism that operates at the organisational level across the Malaysian public service, including Sabah-based federal and state agencies (UKM, 2024).

At the representative level, the Congress of Unions of Employees in the Public and Civil Services (CUEPACS) serves as the peak national body for public sector trade unions in Malaysia. CUEPACS articulates its core mission as upholding "the rights and welfare of public service employees in Malaysia, encompassing issues such as fair

wages, reasonable working hours, and a safe working environment,” and positions itself as a vehicle for “collective voice” that pushes “forward collective interests to the government to ensure the best possible outcomes for public servants” (Mat, 2023). Mat (2023) doctoral case study of CUEPACS provides the most comprehensive academic examination of industrial relations practices in the Malaysian public sector, documenting the organisation’s distinctive experiences, hurdles, and contributions in moulding industrial relations within the sector. Mat’s study traces the historical evolution of Malaysian public sector industrial relations through prominent theoretical frameworks, including unitarism, pluralism, and the human resource management perspective, and identifies bureaucratic rigidity, political interventions, and the far-reaching impacts of globalisation on the civil service workforce as distinctive challenges confronting the sector.

The International Labour Organization’s (ILO) comparative analysis of social dialogue in selected ASEAN countries provides an authoritative international perspective. Bitonio (2022) documents that “Malaysia, the Philippines, Singapore and Thailand have their respective institutions and mechanisms that could allow public sector employees, represented by their unions or associations, to engage in some form of social dialogue with their employers, including collective negotiation or bargaining”. In Malaysian public sector social dialogue mechanisms, “high-level elected or appointed public administrators responsible for State functions represent the State as the employer party,” while “their unions or organisations represent employees, who come from the civil service or the bureaucracy” (Bitonio, 2022). The ILO Committee of Experts on the Application of Conventions and Recommendations (CEACR) has, across multiple observations, addressed the scope of collective bargaining rights for Malaysian public servants, requesting the Government to “ensure that public sector workers not engaged in the administration of the State may enjoy their right to collective bargaining” and to report on “the scope of bargaining in the public sector”. The Committee has further observed that Section 52(1) of the Industrial Relations Act 1967 excludes public servants from Parts II to VI of the Act, including provisions on protection against acts of anti-union discrimination, and has called for “formal provisions clearly recognizing the protection of all public servants and public sector employees not engaged in the administration of the State”.

These institutional arrangements have been tested in practice. In 2021, CUEPACS and the Malaysian Trades Union Congress (MTUC) jointly rejected Public Service Department (JPA) service circulars Number 6 and Number 7 for the year 2020 on the grounds that “there were no prior consultations with workers” and that the circulars “eroded the role of workers’ groups” that were “part of the National Joint Council and the Departmental Joint Council” established as “platforms to negotiate with the government on matters related to the civil service”. CUEPACS President Adnan Mat stated that the JPA’s actions had “undermined the voice of workers’ and their rights in the implementation of any new service circulars”. This episode illustrates both the existence of institutionalised worker voice mechanisms and the contested terrain on which employment relations in the Malaysian public sector operate.

Crucially, these employment relations structures extend specifically to Sabah. The federal MBK and MBJ frameworks apply to Sabah-based federal and state public sector employees. At the state level, the Sabah Labour Advisory Council (SLAC) was established in May 2025 as “a platform to safeguard workers’ rights and strengthen the tripartite relationship between the government, employers, and employees in the state”

(Bernama, 2025). Sabah Chief Minister Datuk Seri Panglima Hajiji Noor articulated that SLAC's 16 council members, comprising "representatives from the government, employers' associations, and workers' unions," would "contribute meaningfully, by providing valuable input to the government in support of Sabah's economic development" (Bernama, 2025). The council's remit encompasses critical employment relations domains including the eradication of forced labour, workplace discrimination and sexual harassment, protection of women and children, flexible working arrangements, and worker housing and facilities. Chief Minister Datuk Seri Panglima Hajiji further anchored SLAC within the ILO's Decent Work Agenda and Convention No. 144 on Tripartite Consultations to Promote the Implementation of International Labour Standards, explicitly linking Sabah's institutional arrangements to international labour governance norms.

Complementing SLAC, the KESUMA Sabah State One-Stop Labour Centre, launched in August 2025 in Kota Kinabalu, consolidates key labour-related services, including the Department of Industrial Relations Sabah, the Department of Trade Union Affairs Sabah, and the Industrial Court of Sabah, under one roof, with explicit functions encompassing "job matching, training applications, union matters, workplace safety consultation and legal dispute resolution" (The Borneo Post, 2025). The federal National Human Resources Policy Framework, launched by Prime Minister Anwar Ibrahim in May 2024, addresses "crucial issues related to workers such as fair compensation, job welfare, labour union movements, job mismatches, and foreign labour" providing an overarching policy architecture that applies to the public sector workforce in Sabah as it does throughout Malaysia (Bernama, 2024).

The employment relations dimensions examined in this review are therefore not abstract constructs imposed upon the Sabah context but rather reflect verifiable institutional realities. The evidence demonstrates that Sabah's public sector operates within a complex employment relations ecosystem comprising national-level joint councils with statutory employee representation, a peak union body with a documented history of contesting unilateral management decisions, state-specific tripartite advisory structures, dedicated labour administration infrastructure, and a national policy framework that explicitly incorporates labour union movements as a governance concern. This institutional density confirms that the Sabah public sector is a legitimate and analytically productive site for employment relations inquiry and that the dimensions of work design, management authority, employee voice, procedural justice, skills formation, and social dialogue are not merely theoretical categories but are embedded in the formal and informal governance of public service employment in the state. The present scoping review's attention to how AI adoption interacts with each of these dimensions is therefore both empirically grounded and institutionally warranted.

Materials and Methods

To capture how artificial intelligence is shifting labour dynamics within a complex subnational landscape, this study avoids forcing emergent workplace transformations into rigid, purely quantitative boxes. Instead, it pairs a systematic scoping review with Reflexive Thematic Analysis (RTA). This dual approach ensures the study remains structurally transparent while leaving room for deep, interpretive analysis. Both methods have been used by Danemayer et al. (2021) and Smith et al. (2023) in their studies. The choice of these methods rests on a deliberate alignment of the study's

ontological, epistemological, and axiological commitments. Ontologically, this inquiry operates from a position of subtle realism. It acknowledges that while the structural rollout of AI within the Sabah civil service is a concrete, material reality, its actual consequences for employment relations are multi-layered, evolving, and deeply dependent on context. The systemic impact of algorithmic governance cannot be measured as a static physical metric. Instead, it unfolds across a fragmented terrain of legal updates, shifting administrative strategies, institutional pressures, and local adjustments by the workforce itself.

To map this intricate landscape, a scoping review serves our goals far better than a conventional systematic review of intervention effects. By adhering strictly to the PRISMA-ScR guidelines (Peters et al., 2020; Tricco et al., 2018), the scoping process provides a systematic, transparent, and reproducible way to track down and chart the literature. This methodology creates a clear audit trail that maps out the broader evidence base, giving us a dependable empirical foundation without forcing us to discard vital grey literature or local policy papers on narrow, hyper-restrictive grounds. Epistemologically, this study is grounded in an interpretivist, social constructivist paradigm, using the "Big Q" qualitative lens developed by Braun and Clarke (2021a; 2021b). Because the intersection of digital transformation and subnational labor politics in developing federations is still heavily under-theorized, real insight cannot be gained through detached, clinical neutrality or basic frequency counts. For this reason, aggregative techniques like meta-aggregation or standard content analysis were set aside. Content analysis reduces rich text to mere frequency tallies, stripping away the organizational context; by contrast, this study aims to untangle the latent power shifts and changes in workplace autonomy brought on by technology. RTA fits the fluid, exploratory parameters of a scoping review perfectly. Rather than just summarizing data surfaces, its core objective is to construct coherent patterns of meaning across highly diverse documents. This framework allows the research team to engage deeply with qualitative data gathered from empirical papers, official policy plans, and verified grey literature, moving beyond basic descriptions to build new conceptual understandings of how AI is reshaping regional labor governance.

Axiologically, this methodology views the researchers' theoretical backgrounds, knowledge of industrial relations, and interpretive insights as vital analytical tools rather than sources of bias to be hidden away. Standard aggregative analyses often try to scrub human subjectivity from the research in an effort to present a flawless, detached front. This study rejects that illusion, opting instead for reflexive accountability. Using RTA ensures that the journey from raw source text to final conceptual themes remains completely transparent and deeply rooted in the data. This analytical honesty is maintained by keeping a detailed research log and a reflective journal throughout the process. In short, combining the systematic structure of a literature search with an interpretively driven qualitative synthesis creates a distinct, rigorous exploratory methodology. It provides both a clear empirical map of the current literature and the necessary conceptual framework to ground future primary research in its opening stages (Booth et al., 2021). The conduct and reporting of this scoping review adhere to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses Extension for Scoping Reviews (PRISMA-ScR) 22-item checklist (Tricco et al., 2018). The synthesis method followed Braun and Clarke's (2021a; 2021b; 2006) reflexive thematic analysis (RTA) in its entirety, operationalised across six phases.

A scoping review protocol was developed a priori. The protocol documented the review objectives, PCC framework, eligibility criteria, search strategy, data charting form, and synthesis plan. Minor deviations from the registered protocol notably the inclusion of two additional institutional repository sources identified during the search process are documented in the supplementary reflexivity statement.

Eligibility criteria

Sources were eligible for inclusion if they met all of the following criteria: (1) Population: Addressed employees, managers, or institutions within the Sabah state public sector, or the Malaysian federal public sector where Sabah was explicitly discussed or data disaggregation permitted Sabah-specific inference. (2) Concept: Engaged substantively with artificial intelligence deployment (including machine learning, natural language processing, generative AI, algorithmic management, and automation systems with AI components) and its implications for at least one dimension of employment relations work design, job quality, skills and training, management authority, employee voice, procedural justice, collective bargaining, or workforce governance. (3) Context: Pertained to the Sabah public administration or the Malaysian federal civil service with direct relevance to Sabah. (4) Publication type: Peer-reviewed journal articles, book chapters, conference proceedings, institutional reports, government documents, and credible grey literature (including reputable news media reporting official government statements or survey results). (5) Timeframe: Published between 1 January 2020 and 1 May 2026. This window captures the period during which AI deployment in public administration accelerated globally and within Malaysia. (6) Language: English or Malay.

Sources were excluded if they: addressed AI purely as a technical architecture without workforce implications; focused exclusively on private sector employment; discussed Sabah's digital transformation in general terms without specific reference to AI; or were opinion pieces without substantive empirical or policy content. The rationale for including grey literature alongside peer-reviewed sources is grounded in the scoping review's mapping purpose. In a rapidly evolving policy domain within a specific subnational jurisdiction, official government statements, programme evaluations, and reputable news reports often constitute the most current evidence. Exclusion of these sources would artificially truncate the evidence base and misrepresent the state of knowledge. This approach is consistent with established scoping review methodology (Peters et al., 2020).

Information sources and search strategy

The search was executed across six electronic databases and repositories: Scopus (coverage: January 2020 to May 2026), Web of Science Core Collection (January 2020 to May 2026), Google Scholar (first 200 results sorted by relevance), the Universiti Malaysia Sabah Institutional Repository, the Malaysian Government Open Data Portal (data.gov.my), and the news agency archives. The search strategy combined three conceptual clusters using Boolean operators: Cluster 1 (Artificial Intelligence): "artificial intelligence" OR AI OR "machine learning" OR "generative AI" OR "algorithmic management" OR "digital transformation" OR automation OR "Google Workspace" OR "Gemini AI". Cluster 2 (Employment Relations): "employment relations" OR "human resource" OR HRM OR "workforce" OR "civil service" OR

“public servant ” OR “employee ” OR “job displacement” OR “skills” OR “training” OR “trade union ” OR “collective bargaining” OR “social dialogue” OR “technostress” OR “job quality” OR “work design”. Cluster 3 (Context): Sabah OR “Borneo” OR “East Malaysia” OR “Malaysia public sector” OR “Malaysian civil service”. Clusters were combined as: Cluster 1 AND Cluster 2 AND Cluster 3. The full search strategy for each database, including database-specific syntax adaptations and filters as the final search was executed on 1 May 2026. Where institutional repository search functionality did not support complex Boolean strings, simplified keyword combinations were used and results manually screened. The reference lists of included sources were hand-searched to identify additional eligible documents. No authors were contacted for unpublished data.

Justification of PRISMA-ScR flow for a scoping review

The PRISMA-ScR flow diagram serves a distinct purpose in scoping reviews compared with systematic reviews of effectiveness. In the latter, the flow primarily documents the winnowing of a defined evidence base to support meta-analytic pooling; in scoping reviews, the flow diagram maps the architecture of the evidence landscape itself revealing the distribution of sources across databases, the reasons for exclusion at each stage, and the ultimate composition of the included evidence base. This transparency enables readers to assess the breadth and boundaries of the mapped domain, identify potential gaps in coverage, and evaluate the review’s methodological rigour. Authors followed the four-stage PRISMA flow structure: identification, screening, eligibility assessment, and inclusion.

Selection of sources

All retrieved records were exported to Covidence systematic review software (Veritas Health Innovation, Melbourne, Australia) for deduplication and screening. Two reviewers (lead author and second reviewer) independently screened titles and abstracts against the eligibility criteria. Prior to commencing formal screening, both reviewers completed a calibration exercise on a random sample of 30 records; inter-rater agreement, assessed using Cohen’s kappa, reached 0.87, indicating strong agreement. Discrepancies at this stage were resolved through discussion. Full-text reports of all records passing title and abstract screening were retrieved and independently assessed for eligibility by the same two reviewers. Reasons for exclusion at the full-text stage were documented. Where full texts could not be accessed through institutional subscriptions or open access platforms, reasonable efforts were made to locate them; records for which full texts remained unavailable were excluded with this reason noted.

Data charting process

A structured data charting form was developed in Microsoft Excel and piloted on three included sources by both reviewers independently, with subsequent calibration to ensure consistent extraction. The form was refined iteratively during the charting process, an approach consistent with scoping review methodology where the extraction framework emerges as familiarity with the evidence base deepens (Levac et al., 2010). Data were extracted by the lead author and verified by the second reviewer through independent extraction of a random 30 per cent sample of included sources, with discrepancies resolved through reflexive discussion.

Data items

The following variables were extracted from each included source: Bibliographic: Author(s), year, title, source type (peer-reviewed article, government report, news article, institutional report, thesis), language, country/region of focus. Contextual: AI technology(ies) examined, public sector domain (e.g., general administration, HR, service delivery), Sabah-specific content (yes/no/directly or indirectly), employment relations dimension(s) addressed. Qualitative data for RTA: All text passages within the included source that addressed AI's relationship with employment relations dimensions were extracted verbatim. These included findings, interpretations, policy statements, survey results, and reported stakeholder perspectives. Extracts ranged from single sentences to entire paragraphs, preserving sufficient surrounding text to maintain contextual meaning.

Critical appraisal

Consistent with established scoping review guidance (Peters et al., 2020; Tricco et al., 2018; Arksey and O'Malley, 2005), formal critical appraisal of individual sources was not performed. Scoping reviews aim to map the extent, range, and nature of evidence rather than to assess the methodological quality or risk of bias in that evidence. The present review's objective of identifying challenges, opportunities, and adaptation strategies does not depend on quality-weighted synthesis; rather, the inclusion of diverse source types including government policy documents and credible news reporting is a deliberate methodological choice to capture the full breadth of available evidence in this under-researched domain.

Synthesis: Reflexive thematic analysis

Synthesis was conducted using Braun and Clarke's reflexive thematic analysis, operationalised through the six-phase process described below. Authors adopted a Big Q qualitative paradigm, treating researcher subjectivity as an analytic resource rather than a bias to be managed out (Braun and Clarke, 2021a). The analytic approach was that inductive themes were developed from the data rather than imposed from pre-existing theoretical frameworks though authors acknowledge the inevitable influence of our disciplinary backgrounds and prior engagement with the employment relations and public administration literatures. Phase 1 Familiarisation: Both reviewers independently read and re-read all extracted qualitative data in its entirety, making reflexive notes on initial impressions, striking patterns, and emotional responses. A shared reflexive journal was maintained throughout the analysis, documenting evolving interpretations, analytic decisions, and the researchers' positioning relative to the data. Phase 2 Coding: Inductive, systematic, complete coding of the full dataset was undertaken by the lead author using Atlas.ti 24. Coding was organic and iterative: codes captured both semantic (explicit, surface-level) and latent (underlying, conceptual) meanings, and evolved as engagement with the data deepened. The second reviewer independently coded a 40 per cent subset of the data. Codes were compared through reflexive dialogue rather than statistical agreement metrics, with differences treated as opportunities to enrich interpretive depth.

Phase 3 Generating Initial Themes: Collated codes were examined for broader patterns of shared meaning and clustered into candidate themes and sub-themes. Visual

mapping supported the identification of relationships among candidate themes. Throughout this phase, candidate themes remained closely grounded in the coded data while beginning to coalesce around central organising concepts. Phase 4 Reviewing Themes: Candidate themes were subjected to a two-level review. At Level 1, each candidate theme was checked against its constituent coded extracts to ensure internal coherence that the extracts clustered under the theme genuinely shared the posited meaning. At Level 2, each candidate theme was reviewed against the entire dataset to ensure external distinction that the theme captured something distinctive, not better represented by another theme. This iterative process resulted in themes being split, merged, refined, or discarded. The thematic structure was finalised only when both reviewers agreed that each theme demonstrated internal coherence and external distinction. Phase 5 Defining and Naming Themes: For each final theme, a detailed definition was written, establishing its scope, boundaries, central organising concept, and the specific contribution it makes to addressing the research question. Concise, evocative theme names were crafted to capture each theme's core meaning. Phase 6 Writing Up: The analytic narrative presented in weaves together data extracts from multiple sources with the researchers' interpretive commentary, producing a coherent, argument-driven account that moves beyond description to offer conceptually grounded insight into how AI is transforming employment relations in the Sabah public sector.

Reflexivity statement

The research team comprised three members: a senior scholar in public sector employment relations with extensive qualitative research experience in Southeast Asian contexts; a mid-career researcher in public administration and digital governance; and an early-career researcher with methodological expertise in reflexive thematic analysis and prior experience studying Malaysia's civil service. The team's disciplinary orientations spanning industrial sociology, public administration, and critical data studies shaped the analytic gaze brought to the data. The lead author's prior work on employment relations in Malaysia's plantation and manufacturing sectors informed an attentiveness to power asymmetries and the institutional legacy of tripartite governance structures; the second author's expertise in digital government brought sensitivity to the technical and policy dimensions of AI adoption; and the third author's RTA expertise ensured methodological rigour and reflexive accountability.

Authors approached the review with a shared assumption that AI adoption in public sector settings is neither inherently beneficial nor detrimental to employment relations; its consequences depend on the institutional, regulatory, and participatory mechanisms through which it is introduced and governed. Authors were alert to the risk of over-reading Sabah-specific distinctiveness and to the influence of our own normative commitments to worker voice and procedural fairness. The reflexive journal and regular team discussions served as mechanisms for surfacing and interrogating these influences. The analysis meets Braun and Clarke (2006) 15-point quality checklist for reflexive thematic analysis: themes are complex and nuanced; analysis moves beyond description; the researchers' active role in knowledge production is explicitly acknowledged; extracts are used illustratively but analytically; and the analytic narrative demonstrates conceptual depth.

Methodological justification: Scoping review and reflexive thematic analysis as a preliminary investigation

The methodological architecture of this study is grounded in an explicit epistemological commitment to preliminary, terrain-mapping inquiry. A scoping review was selected not as a methodological compromise but as the intellectually appropriate instrument for a domain where the evidence base is known to be heterogeneous, dispersed, and theoretically immature. Arksey and O'Malley (2005) established scoping reviews as a distinct approach for mapping the breadth and depth of a field, identifying knowledge gaps, and determining the value of undertaking a full systematic review. Subsequent methodological refinements by Peters et al. (2020), Tricco et al. (2018), and Levac et al. (2010) reinforced that scoping reviews are particularly suited to exploratory research questions that ask "what is known about this concept in this context" rather than "what is the pooled effect of this intervention". In the case of artificial intelligence and employment relations in Sabah's public sector, the literature is scattered across peer-reviewed journals, government policy addresses, institutional repositories, and credible news media a configuration that defies the assumptions of homogeneity and quality-weighted synthesis that underpin systematic reviews of effectiveness. The scoping review design therefore permits the inclusion of this full evidence topography, producing a cartographic account that is valuable precisely because it does not prematurely exclude sources on methodological grounds.

Within this scoping design, authors adopted Braun and Clarke's reflexive thematic analysis (RTA) as the synthesis method, a decision that carries its own academic rationale. Conventional scoping reviews often default to descriptive content analysis or simple frequency counts of concepts, which can flatten complexity and obscure latent patterns. The present review, however, has a generative purpose: it aims not merely to inventory what has been written but to construct conceptually coherent themes that capture shared meanings across disparate source types, thereby articulating a preliminary analytical framework that can guide subsequent, more targeted primary research. RTA, as articulated by Braun and Clarke (2021a; 2021b; 2006), is explicitly designed for this interpretive task. It treats the researcher's subjectivity as a resource rather than a contaminant, and it produces themes that are not summaries of data but "patterns of shared meaning underpinned by a central organising concept" (Braun and Clarke, 2021b). This makes RTA uniquely compatible with the epistemic demands of a preliminary study: the themes constructed through RTA do not claim to be definitive or exhaustive; rather, they function as initial conceptual anchor points whose validity and transferability can be tested, extended, or challenged through subsequent qualitative fieldwork, surveys, or longitudinal designs.

The combination of scoping review methodology with RTA thus produces a rigorously verifiable preliminary study. The scoping component ensures systematic, transparent, and reproducible identification and charting of sources in accordance with the PRISMA-ScR checklist (Tricco et al., 2018), thereby providing a credible audit trail that establishes the evidential basis for all subsequent claims. The RTA component ensures that the synthesis moves beyond description to offer interpretively rich, thematically structured insights that are transparently connected to the reviewed sources through the analytic audit trail and the reflexive journal. This dual commitment to systematic retrieval and interpretive synthesis positions the scoping review with RTA as a distinctive form of preliminary investigation that generates both evidential mapping and conceptual scaffolding for a research programme that, in Sabah's case, remains in its formative stages (Booth et al., 2021). It is precisely this capacity to identify not only what is known but also what remains unexamined and to do so through a

methodologically transparent, replicable, and interpretively accountable process that justifies the use of scoping review and RTA as the main method for this preliminary study of AI and employment relations transformation in the Sabah public sector.

Results and Discussion

Study selection and characteristics

The search yielded 847 records across the six information sources: Scopus (n = 89), Web of Science (n = 73), Google Scholar (n = 200, limited to first 200 by relevance), Universiti Malaysia Sabah Institutional Repository (n = 42), the Malaysian Government Open Data Portal (n = 18), and the archive (n = 425). After removal of duplicates (n = 156), 691 records proceeded to title and abstract screening. Of these, 594 were excluded as clearly irrelevant (e.g., addressed private sector AI applications, discussed digital transformation without AI specificity, or pertained to jurisdictions other than Sabah or Malaysia). Ninety-seven full-text reports were sought for eligibility assessment; full texts could not be retrieved for 12 records (inaccessible institutional reports or news articles behind permanent paywalls). Eighty-five full-text reports were assessed against eligibility criteria. Sixty-eight reports were excluded for the following reasons: no substantive engagement with AI (n = 24); focused on private sector or non-Sabah jurisdiction without transferable insight (n = 19); addressed digital infrastructure without employment relations content (n = 16); opinion or advocacy pieces without empirical or policy substance (n = 9). Seventeen sources met all inclusion criteria and were included in the synthesis. Figure 1 shows the PRISMA Scr flow diagram traces the identification of 847 records from six databases, removal of 156 duplicates yielding 691 records for screening, exclusion of 594 at title/abstract stage, retrieval of 97 full-text reports with 12 inaccessible, eligibility assessment of 85 full-texts, exclusion of 68 with reasons, and final inclusion of 17 sources (*Table 1* and *Figure 1*). Based on the source material provided, here is a consolidated data *Table 2* summarizing the characteristics of the 17 included sources in the systematic literature review. The 17 included sources exhibit considerable heterogeneity. Government policy addresses and statements by Sabah's Head of State and federal ministers provide authoritative accounts of strategic intent, but their aspirational character limits insight into implementation realities. News reports from , the Borneo Post, and the Daily Express offer real-time documentation of AI initiatives and public statements by senior officials, including survey data not yet published in peer-reviewed form. Peer-reviewed articles predominantly from Malaysian university repositories and Scopus-indexed journals contribute empirical depth on technostress, recruitment systems, and competency frameworks. International reports from the OECD and the World Bank situate Sabah's experience within broader global and national trends.

Table 1. *Characteristics of included sources (Abbreviated).*

Characteristic	Category	N
Source type	Government policy statement / address	4
	News report (government-verified data)	6
	Peer-reviewed journal article	3
	Institutional report / survey	2
	International agency report	2
Year of publication	2020–2021	2
	2022–2023	3
	2024–2025	7
	2026	5

AI technology focus	Generative AI / productivity tools	8
	Algorithmic HR / recruitment	3
	General AI / digital transformation	6
Employment relation dimension	Work design / job displacement	10
	Skills, training, and competency	12
	Management authority / algorithmic governance	6
	Employee voice / social dialogue	3
	Job quality / well-being / technostress	5
Sabah specifically	Directly Sabah-focused	10
	Malaysia-wide with Sabah relevance	7

Table 2. *Characteristics of included sources (n = 17).*

Characteristic	Category	Count (n)
Source Type	News report (government-verified data)	6
	Government policy statement / address	4
	Peer-reviewed journal article	3
	Institutional report / survey	2
	International agency report	2
Year of Publication	2024–2025	7
	2026	5
	2022–2023	3
	2020–2021	2
AI Technology Focus	Generative AI / productivity tools	8
	General AI / digital transformation	6
	Algorithmic HR / recruitment	3
Sabah Specificity	Directly Sabah-focused	10
	Malaysia-wide with Sabah relevance	7
Employment Relations Dimension*	Skills, training, and competency	12
	Work design / job displacement	10
	Management authority / algorithmic governance	6
	Job quality / well-being / technostress	5
	Employee voice / social dialogue	3

*Note: *means total "n" for Employment Relations Dimension exceeds 17 as sources may address multiple dimensions.*

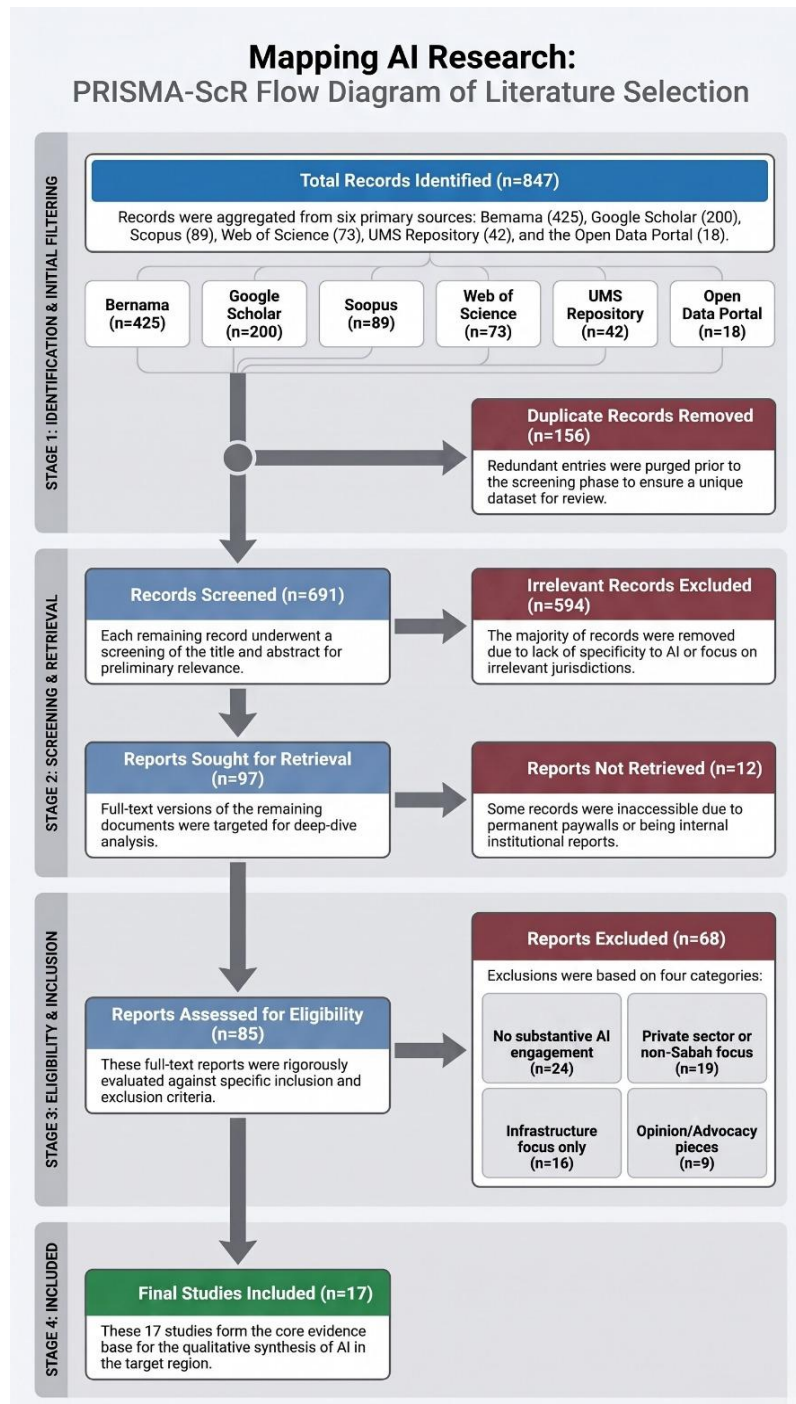


Figure 1. PRISMA Scr Flow Diagram.

Reflexive thematic analysis findings

The reflexive thematic analysis constructed three overarching themes, each capturing a distinct pattern of shared meaning in how the included sources represent AI's transformation of employment relations in the Sabah public sector. These themes are not discrete categories but interconnected facets of a complex phenomenon.

Theme 1: AI-induced reconfiguration of public service work design

Central Organising Concept: AI integration into Sabah's public sector is fundamentally reconfiguring the composition, experience, and valuation of public service work. This reconfiguration generates a duality: tangible productivity enhancements that promise to liberate civil servants from repetitive tasks, alongside profound anxieties about job displacement and deskilling. These dynamics are refracted through Sabah's specific structural conditions, its reliance on the public sector as a primary formal employer, its digital infrastructure gaps, and the concentration of AI literacy in younger, urban cohorts. The evidence presents a consistent narrative of tasks undergoing automation or augmentation. Federal Public Service Director-General Wan Ahmad Dahlan Abdul Aziz stated explicitly that "AI is already capable of taking over routine and analytical tasks" and that departmental heads must "review job descriptions" to ensure positions remain relevant (The Sun, 2026). This framing AI as an inevitability requiring workforce adaptation pervades official discourse. At the Sabah state level, Tuan Yang Terutama Tun Datuk Seri Panglima Musa Aman's policy address to the 17th State Legislative Assembly positioned AI as an instrument to "streamline data management, accelerate decision-making, and reduce the public sector's reliance on resource-intensive manual processes" (Daily Express, 2026). The Sabah Digital Government Innovation master plan operationalises this vision through digital platforms intended to replace paper-based workflows.

Productivity gains are documented with specificity. A survey conducted by the Ministry of Digital in collaboration with Universiti Malaysia Sabah reported an AI application readiness index of 3.56 out of 5 among state civil servants, indicating "a strong foundation for accepting and applying AI technology" (Daily Express, 2025a). At the federal level with direct implications for Sabah, given federal-state programme linkages 97 per cent of civil servants participating in the Google Workspace Gemini programme reported saving an average of 3.25 hours per week, and 91 per cent stated that generative AI tools improved their work quality (Daily Express, 2025b). The World Bank's 2025 GovTech Skills Survey, cited by Federal Digital Minister Gobind Singh Deo, found that civil servants using generative AI tools saved an average of 2.5 hours of working time daily (World Bank, 2025). However, the productivity narrative coexists with a palpable anxiety about employment stability. The MyMahir Impact Study estimates that 620,000 jobs, 18 per cent of Malaysia's formal sector, will be significantly affected by AI within three to five years (TalentCorp, 2025). While this projection covers the entire economy, the federal Public Service Department's announcement of a dedicated study to assess AI's impact on civil service positions signals recognition that the public sector is not immune (The Sun, 2026). Sabah Chief Minister Hajiji Noor publicly warned civil servants about AI-related risks, noting that industries including banking, healthcare, and manufacturing have already incorporated AI to streamline operations and that the "greatest danger lies in AI's misuse" (Sokial, 2025). This framing simultaneously acknowledging AI's transformative power while cautioning against its perils captures the ambivalent positioning of political leadership.

The competency dimension emerges as the most frequently addressed employment relations concern across the included sources. SPANS Chairman Sukarti Wakiman stated that "students and future job seekers must acquire new skills, especially in AI and digital technology," noting that SPANS advertised 842 job vacancies in 2024, attracting approximately 8,000 candidates (The Borneo Post, 2025). Universiti Malaysia Sabah senior lecturer Azizan Haji Morshidi argued that "mastery of AI and paperless administration will make Sabah more efficient, transparent and people-friendly" (Ramli,

2026). The Sabah Education, Science, Technology and Innovation Ministry is formulating a “One-Staff or One-AI programme” to improve AI literacy among civil servants (Ramli, 2026). Yet the World Bank’s Malaysia assessment identifies a critical constraint: nearly half of federal ministry respondents reported difficulties hiring staff with necessary digital competencies, rising to 64 per cent in the Ministry of Digital itself (Zahid, 2025). This skills paradox heightened demand for AI competencies coexisting with systemic shortages is likely more acute in Sabah given its historical digital infrastructure deficit.

Theme 2: Algorithmic governance and the shifting employment relationship

Central Organising Concept: AI deployment is altering the fundamental character of the employment relationship in the Sabah public sector by introducing algorithmic intermediaries into processes of recruitment, task allocation, performance evaluation, and worker monitoring. These changes redistribute authority between human managers and automated systems, creating new forms of opacity in decision-making, generating concerns about procedural fairness, and producing psychosocial strain among workers required to interact with systems whose logic they may not fully understand. Algorithmic recruitment systems represent the most documented entry point. Sabah’s Public Service Commission has operated an Electronic Recruitment system since 2008, but the integration of AI-enabled screening and assessment tools represents a qualitative shift (Arshad and Arisa, 2016). Research on AI-augmented recruitment in the Malaysian public sector context highlights dual effects: enhanced productivity in processing large applicant pools, alongside structural risks of algorithmic discrimination that may undermine public authority (Benkirane and Benazzi, 2025). The PSFWF (2025) guidance on algorithmic management in public sector workplaces while developed for a different jurisdiction provides an analytically relevant framework for the Sabah context, defining the scope of systems that “take or support employment decisions” and emphasising the governance challenges they pose.

Concerns about procedural fairness and accountability permeate the evidence. Chief Minister Hajiji Noor’s warning about AI’s “misuse to spread falsehoods that are difficult to contain” (Sokial, 2025) extends beyond disinformation to encompass broader anxieties about unreliable or unaccountable automated outputs influencing employment decisions. The OECD (2023) has documented how AI adoption in the workplace can “blur accountabilities of decisions,” a concern echoed in the Malaysian context by the IBA’s analysis (Bhatia and Alagaratnam, 2026), which notes the absence of specific legislation regulating AI use at work despite 33 per cent of surveyed Malaysian employees reporting AI use in 2025. Technostress emerges as a significant but under-measured dimension of the shifting employment relationship. Abdullah et al. (2025), studying 490 HRIS users across 37 Malaysian public sector organisations, found that technostress is significantly associated with HRIS user satisfaction, and that technology self-efficacy moderates this relationship. The conceptual framework linking technostress to Malaysian public servant well-being identifies ongoing digitalisation initiatives as creating challenges that “may impact employee well-being” (Abdullah et al., 2025). While Sabah-specific technostress data are absent from the reviewed evidence, the structural conditions for elevated technostress rapid technology deployment, limited training coverage, and infrastructure constraints are arguably more pronounced in Sabah than in the federal administrative centre.

A notable silence in the evidence concerns collective voice. Of the 17 included sources, only three substantively addressed trade unions, social dialogue, or worker participation mechanisms. The OECD (2023) chapter on social dialogue and AI adoption provides the most comprehensive treatment, finding that collective bargaining and worker involvement are associated with better AI adoption outcomes. UNISON (2026) and The Trades Union Congress (2025) advocacy positions, while from outside the Malaysian context, highlight an agenda of statutory consultation obligations, transparency requirements, worker data protection that has no visible parallel in the Sabah evidence. This silence is analytically significant: it suggests that the transformation of employment relations through AI is occurring in an institutional environment where worker voice mechanisms are either absent or not yet activated in relation to technological change.

Theme 3: Strategic adaption through institutional capacity building

Central Organising Concept: Responses to AI-driven employment relations transformation cluster around three interconnected forms of institutional capacity building training and skills development, policy framework construction, and the embryonic emergence of social dialogue. These adaptation efforts are characterised by supply-side orientation (focusing on equipping workers with skills rather than shaping technology deployment through worker participation), fragmentation across multiple initiatives, and a temporal lag between technological adoption and institutional response. Training and skills development dominate the adaptation landscape. The federal AI at Work 2.0 programme, targeting 445,000 civil servants for generative AI training using Google Workspace and Gemini, represents the most ambitious initiative (Bhatia and Alagaratnam, 2026). Sabah was the first state to deploy Google Workspace AI applications (Daily Express, 2025b). Complementary initiatives include the MyDIGITAL-Microsoft GovTech Innovation partnership, which trained civil servants in cloud computing, data and AI, and cybersecurity (MyDIGITAL Corporation, 2023); the INTAN-Huawei collaboration on digital leadership; and the CCDG Programme at UNIMAS, designed to “transform civil servants into digital catalysts” (IBS, 2025). At the Sabah level, the state government has implemented AI skills courses at polytechnics, public universities, and community training centres (Ramli, 2026), and the Sabah Public Service Human Resource Training Policy (DLSM) provides an institutional framework for workforce development (Daily Express, 2025a). The first Gamuda AI Academy in East Malaysia, launched in Sabah in 2025, aims to produce graduates “at the forefront of AI transformation across Sabah, be it in the public sector, the startup community or enterprises” (Gamuda Berhad, 2025).

Policy framework construction represents the second adaptation strand. The JPA Strategic Plan 2026–2030 outlines five strategic thrusts for public service reform, with a companion Digitalisation Strategic Plan encompassing four thrusts, 18 strategies, and 129 programmes (The Sun, 2026). Sabah’s SDGI master plan provides the state-level architecture, supplemented by the Sabah Cyber Security Empowerment Programme and plans for an AI Mini Centre to support AI ecosystem development (Utusan Borneo, 2026). The Department of Statistics Malaysia’s Strategic Plan 2026–2030 promises improvements in digital data quality to enable “more responsive, evidence-based education, healthcare and economic policies” (Ramli, 2026). TYT Tun Musa Aman’s policy address positioned human capital development as a “priority as a driver of state productivity and innovation,” with TVET strengthening and skills gap analysis as key

instruments (Utusan Borneo, 2026). Yet these adaptation efforts display three critical limitations evident in the synthesised evidence. First, they are overwhelmingly supply-side in orientation focused on training workers to adapt to AI rather than shaping how AI is designed, procured, and deployed. The absence of worker participation mechanisms in technology governance decisions means that the adaptation burden falls disproportionately on individual employees. Second, coordination across initiatives appears fragmented: federal programmes, state-level policies, university training, and private-sector partnerships operate with limited visible integration. Third, the temporal lag between technology deployment and institutional response creates a window of vulnerability in which AI systems are operational but governance frameworks remain under-developed. The federal Public Service Department's AI impact study was announced only in January 2026 well after substantial AI deployment had already occurred across the civil service.

Key findings

This scoping review mapped 17 sources addressing AI's transformation of employment relations in the Sabah public sector. Three themes were constructed through reflexive thematic analysis: the reconfiguration of work design through simultaneous productivity enhancement and displacement anxiety; the emergence of algorithmic governance altering authority, accountability, and worker well-being; and strategic adaptation centred on training, policy frameworks, and nascent social dialogue. The evidence base is characterised by heterogeneity spanning government statements, news reports, surveys, and academic studies and by significant gaps, particularly concerning collective voice, equity impacts, and longitudinal outcomes.

Critical comparison with existing literature

The findings both resonate with and depart from the global evidence base. The productivity gains documented in Sabah civil servants saving 2.5 to 3.25 hours daily or weekly through AI tools align with findings from high-income contexts. The OECD (2025) reported similar time savings, and Bian et al. (2025) systematic review identified efficiency enhancement as a consistent benefit across 47 studies. However, the Sabah evidence reveals a distinctive pattern: productivity gains are foregrounded in official discourse while displacement risks are acknowledged but deferred to future study. This temporal displacement of employment insecurity "AI will affect jobs, but we will study it" contrasts with the more precautionary discourse in some European jurisdictions, where regulatory frameworks (the EU AI Act) and union consultation mechanisms provide institutional channels for addressing displacement concerns concurrently with deployment. The competency paradox identified in Theme 1 acute demand for AI skills coexisting with systemic shortages is a global phenomenon but takes locally specific form in Sabah. The World Bank's finding that 64 per cent of Malaysia's Ministry of Digital reported hiring difficulties for digital roles (Zahid, 2025) is striking: the ministry responsible for driving digital transformation cannot itself recruit the necessary talent. This pattern echoes findings from developing-country contexts. Chilunjika et al. (2022) identified similar capacity constraints in South Africa's public sector, and research on AI readiness in Egypt and Ghana highlights infrastructure, data availability, and workforce skills as binding constraints. Sabah's position as a subnational jurisdiction within a federation adds a further layer: the state's capacity to address these

constraints depends partly on federal resource allocation and policy coordination, introducing a vertical governance dimension absent from unitary-state analyses.

The silence on collective voice in the Sabah evidence is perhaps the most significant departure from the international literature. The OECD (2023) and European trade union research (UNISON, 2026; Trades Union Congress, 2025) position social dialogue as central to legitimate and effective AI adoption in the public sector. The absence of comparable evidence from Sabah no included source addressed trade union engagement with AI deployment may reflect the character of Malaysia's industrial relations system, where public sector unionism operates within a tightly regulated framework and technological change has not historically been a bargaining priority. Alternatively, it may indicate a genuine evidence gap: trade union engagement may be occurring but not documented in sources accessible through this review's search strategy. Either interpretation carries implications for policy and research.

Strengths and limitations

This scoping review has several strengths. Methodologically, it is the first systematic synthesis of evidence on AI and employment relations in the Sabah public sector, employing rigorous PRISMA-ScR procedures and a transparent, theoretically grounded RTA approach (Braun and Clarke, 2021a; 2021b; Tricco et al., 2018). The inclusion of grey literature alongside peer-reviewed sources captures the real-time character of policy development in a rapidly evolving domain. The explicit engagement with researcher reflexivity documented in the supplementary reflexivity statement enhances the trustworthiness of the interpretive synthesis. Limitations must also be acknowledged. First, the evidence base is small (17 sources) and heterogeneous; the thematic synthesis is necessarily provisional and does not claim saturation. Second, the exclusion of Malay-language sources that could not be fully translated may have introduced language bias, although key local-language news sources (Utusan Borneo, Sin Chew Daily) were included. Third, the review captures a moving target: AI deployment in Sabah's public sector is accelerating, and findings may date rapidly. Fourth, the absence of primary qualitative data interviews or ethnographic observation with Sabah civil servants means that the synthesis is mediated entirely through published sources, which may over-represent official perspectives and under-represent worker experiences. Fifth, the scoping review design precludes formal quality appraisal, so the relative evidentiary weight of different source types cannot be systematically assessed.

Reflexivity in interpretation

Our interpretation of the evidence was shaped by our disciplinary orientations and normative commitments. The lead author's background in employment relations research sensitised the analysis to the structural power asymmetries inherent in employer-driven technology adoption. This lens may have amplified attention to the absence of worker voice relative to what a public administration or computer science perspective might foreground. The second author's digital governance expertise drew the analysis toward the institutional and policy dimensions of adaptation. The third author's RTA expertise ensured that interpretive claims remained grounded in the data rather than imposed upon it. Throughout the analysis, the reflexive journal captured moments of interpretive tension. For instance, authors debated whether Theme 2's

emphasis on algorithmic governance and procedural fairness was warranted by the relatively thin Sabah-specific evidence on this dimension, or whether it represented an importation of concerns from the international literature. Authors resolved this through careful re-examination of the data, identifying sufficient evidence Sabah Chief Minister's warning about AI misuse, Abdullah et al.'s technostress findings, the JPA Director-General's framing of AI as "already capable of taking over" to ground the theme in the Sabah context while acknowledging the influence of international frameworks on our interpretive lens (The Sun, 2026; Abdullah et al., 2025; Sokial, 2025).

Significant practical and theoretical implications

The review's findings carry implications for policy, practice, and theory. Policy implications: The evidence suggests that Sabah's current AI adoption trajectory is characterised by a governance deficit in employment relations. Training initiatives, while necessary, are insufficient as a stand-alone adaptation strategy. Authors recommend three policy priorities: (a) embedding mandatory social dialogue mechanisms including consultation with public sector unions and staff associations into AI procurement and deployment decisions; (b) developing Sabah-specific AI-in-employment guidelines that address algorithmic transparency, accountability for automated decisions affecting workers, and worker data protection; and (c) establishing a baseline longitudinal study tracking AI's impact on public sector job quality, skill utilisation, and employment stability in Sabah.

Practical implications: For public sector managers in Sabah, the findings highlight the need for proactive workforce planning that anticipates AI-driven role reconfiguration. The JPA Director-General's call for job description reviews provides an immediate actionable mandate (The Sun, 2026). Managers should complement technology deployment with transparent communication about AI's role in work processes, investment in digital leadership capabilities, and attention to the psychosocial dimensions of technological change, particularly technostress. Theoretical implications: The Sabah case extends employment relations theory by demonstrating how AI-driven transformation unfolds in a subnational jurisdiction within a developing federation. The macro-level drivers identified in the global literature automation potential, algorithmic management, skill-biased technological change are all present in Sabah, but they are refracted through locally specific institutional arrangements: a public sector employment structure shaped by federal-state dynamics, an industrial relations system with limited collective bargaining scope over technological decisions, and digital infrastructure constraints that mediate both AI adoption and its workforce consequences. The case suggests that existing theoretical frameworks, developed primarily in high-income unitary states, require extension to adequately capture the vertical governance dimension (federal-state relations), the infrastructure-digital divide as a mediator of employment outcomes, and the distinctive character of worker voice in political economies where trade unions operate within constrained institutional spaces.

By exposing these critical empirical and conceptual gaps, this scoping review establishes a compelling programmatic trajectory for a primary qualitative thesis research within the Sabah public sector employment relations. To transcend the top-down, policy-centric narratives that dominate the current literature, a robust qualitative research design utilizing in-depth semi-structured interviews and purposive focus groups with civil servants, departmental managers, and union representatives is urgently

required to decode the micro-political realities, psychological contract reconfigurations, and latent technostress that standardized data fails to capture. This qualitative thesis inquiry must systematically address the documented empirical silence surrounding collective voice by interrogating how subnational labour institutions, most notably CUEPACS Sabah, are actively navigating algorithmic governance, formulating responsive bargaining strategies, and advocating for regulatory frameworks to secure worker participation in technology procurement within labour relations realm. Centering an inductive qualitative study within Sabah's distinct administrative ecosystem provides the granular contextual depth necessary to theorize how global AI imperatives are refracted through East Malaysian institutional structures, the public sector employment relations particularly. Ultimately, establishing this qualitative baseline provides the essential conceptual scaffolding required to later inform comparative cross-border analyses across Sarawak and Labuan, while serving as a necessary theoretical foundation for future macro-level longitudinal surveys tracking long-term causal outcomes in job stability, skill shifting, and public sector workforce well-being.

Conclusion

This scoping review provides the first systematic mapping of evidence on artificial intelligence and employment relations transformation in the Sabah public sector. The findings reveal a domain in early-stage transformation: AI deployment is underway, productivity benefits are being realised, but the institutional mechanisms for governing AI's employment consequences social dialogue, worker participation, regulatory frameworks lag substantially behind. The constructed themes of work design reconfiguration, algorithmic governance, and strategic adaptation offer an analytical architecture for understanding this transformation and for guiding subsequent empirical research. The evidence base, while modest, points unambiguously to the urgency of embedding worker voice and participatory governance into Sabah's digital agenda. Without such embedding, the risk is that AI-driven modernisation enhances administrative efficiency at the cost of employment relations quality, an outcome that would undermine the broader goals of public sector reform.

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Conflict of interest

The authors confirm that there is no conflict of interest involve with any parties in this research study.

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