Volume 4, No. 10 October 2026, pp. 1565-1572
e-ISSN 3031-5786
DOI: https://doi.org/10.46799/adv.v4i10.709

ADVANCES IN SOCIAL HUMANITIES RESEARCH

Automating Withholding Tax Reconciliation as Part of Digital Transformation: A Case Study of the Largest Copper Company in Indonesia

Riris Tamara*, Sylviana Maya Damayanti
Institut Teknologi Bandung, Indonesia
Email : tamarasir@gmail.com*, Sylvianamaya@itb.ac.id

Keywords:
Withholding Tax Reconciliation; Business Process Re-engineering; Digital Transformation; Core Tax System; Audit Readiness Tax Compliance Automation.

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Abstract

PER-8/PJ/2025, concerning the Core Tax Administration System, and PMK 15/2025, which establishes strict, nonextendable tax audit deadlines, introduced significant compliance challenges for Indonesia's largest copper mining company (hereinafter referred to as "the Company"). The Company's six-month manual withholding tax (WHT) reconciliation process, covering Income Tax Articles 23, 26, 4(2), and 15, was incompatible with the operational requirements of these regulatory frameworks. Employing Business Process Reengineering (BPR) and an exploratory sequential mixed-methods design, this study mapped the existing (as-is) process, identified operational gaps, and developed a proposed automated reconciliation solution. Interviews with internal stakeholders and four external tax consultants identified three critical dimensions: a velocity gap, characterized by a six-month reconciliation cycle compared with the near-real-time processing requirements of the Core Tax Administration System; an accuracy gap, resulting from inconsistent tax classifications dependent on individual staff members; and an audit readiness gap, arising from the absence of readily accessible, traceable reconciliation records and the potential escalation of unresolved compliance issues into tax investigations. The proposed rule-based automated reconciliation pipeline was projected to reduce annual labor hours by 90%, improve alignment with PMK 15/2025 requirements, and generate substantial financial benefits. The study concluded that automating the Company's WHT reconciliation process represented a strategic compliance transformation, shifting from reactive manual reconciliation toward a continuously updated, traceable, and audit-ready system.

INTRODUCTION

The Indonesian tax regulatory landscape underwent a fundamental transformation in 2025 with the introduction of two major regulatory frameworks (Anugrah et al., 2025; Hidayah, 2026; Meitasari et al., 2025; Silalahi, 2025). PER-8/PJ/2025, associated with the implementation of the Core Tax Administration System (Coretax), introduced significant changes to tax administration and audit procedures. Under this system, auditors from the Directorate General of Taxes (DGT) can access transaction-level data and prepare lists of transactions for examination, shifting the emphasis from general

documentation toward transaction-specific verification and substantiation. Meanwhile, PMK 15/2025 established stricter procedural requirements for tax audits, including a five-working-day period for responding to the Notification of Tax Audit Findings (Surat Pemberitahuan Hasil Pemeriksaan, SPHP) and a one-month period for submitting requested supporting documents.

For Indonesia's largest copper mining company (hereinafter referred to as "the Company"), a subsidiary of an international mining corporation listed on the New York Stock Exchange (NYSE) and one of Indonesia's largest corporate taxpayers, these regulatory developments created significant compliance challenges. The Company's withholding tax (WHT) reconciliation process, which involved a six-month annual cycle conducted entirely through manual, spreadsheet-based procedures covering Income Tax Articles 23, 26, 4(2), and 15, was operationally misaligned with the requirements of these regulatory frameworks. A reconciliation process requiring six months to complete could not adequately support a one-month document submission and five-working-day response deadlines. Beyond processing time, the manual approach presented several inherent risks, including inconsistent tax classifications resulting from variations in staff expertise, the absence of systematic accuracy assessments, and difficulties in producing traceable supporting documentation on demand. Furthermore, the Company operated within the scope of Section 404 of the Sarbanes-Oxley Act (SOX), which requires management to assess the effectiveness of internal controls over financial reporting (Bainbridge, 2022; Bajra et al., 2023; Cao et al., 2024; Lee, 2022; Obeng-Nyarko, 2023; Pellegrino, 2022; Su et al., 2022). The reliance on manual procedures and individual staff knowledge presented challenges to maintaining consistently documented, auditable, and repeatable internal controls (Khan & Mita, 2023; Lartey et al., 2023; Singh & Best, 2023).

Tax administrations worldwide are digitalizing, and evidence suggests that digital tools can strengthen compliance; for example, mandatory VAT e-invoicing in Peru was associated with higher reported tax liabilities (Bellon et al., 2022). At the organizational level, digital transformation involves using digital technologies to change business processes and value creation, and it requires attention to strategy and organizational change (Hanelt et al., 2021; Mergel et al., 2019; Verhoef et al., 2021; Vial, 2019). Robotic process automation (RPA) has been applied in accounting to automate repetitive, rule-based tasks (Kokina & Blanchette, 2019; Zhang et al., 2023), whereas business process reengineering provides a structured basis for redesigning such processes (Hammer & Champy, 1993; Schallmo & Williams, 2018).

This study aimed to evaluate the Company's existing WHT reconciliation process, identify regulatory compliance gaps, develop an automated reconciliation solution, and estimate its potential operational efficiency and financial benefits. Specifically, the research objectives were to (1) map the existing (as-is) WHT reconciliation process and identify its principal weaknesses; (2) examine the gaps between existing operational practices and applicable regulatory requirements; (3) design an automated reconciliation solution to address the identified deficiencies; and (4) estimate the potential efficiency improvements and financial benefits associated with the proposed automation.

To address these challenges, this study applied Business Process Reengineering (BPR) principles (Hammer & Champy, 1993) to evaluate the existing reconciliation workflow, identify compliance deficiencies, and develop a proposed automated solution. The study offered three principal contributions: (1) a replicable BPR-based methodological framework for automating WHT reconciliation within Indonesia's extractive industry; (2) primary empirical evidence concerning the operational and compliance implications of Coretax and PMK 15/2025 for a major corporate taxpayer, supported by triangulation of perspectives from internal stakeholders and external tax practitioners; and (3) an application of the logic-centric, platform-independent automation design principle proposed by Syed et al. (2020) to the context of WHT reconciliation.

METHOD

This study employed an exploratory sequential mixed-methods design based on Creswell and Plano Clark (2018), comprising four consecutive phases. The design integrated qualitative methods to examine the Company's existing withholding tax (WHT) reconciliation process and identify compliance gaps with quantitative methods to determine the scope of automation and estimate potential efficiency improvements.

Phase 1 involved diagnostic process mapping and in-depth semi-structured interviews to identify bottlenecks in the existing (as-is) WHT reconciliation process, including a gap analysis supported by external expert triangulation to assess discrepancies between existing practices and applicable regulatory requirements. Phase 2 employed Pareto analysis of five years of historical general ledger (GL) transaction data (2020–2024) to identify priority areas for automation. Phase 3 consisted of the to-be automated reconciliation workflow design. Phase 4 involved predictive simulation using the Delta Savings formula and cost-benefit analysis (CBA) to estimate the operational efficiency improvements and financial benefits of the proposed automated reconciliation system.

Data were collected through semi-structured interviews with ten informants, comprising six internal Company stakeholders representing different organizational levels, including WHT accountants, the chief accountant, superintendents, the general superintendent of corporate tax audit management, and the vice president of tax, and four independent external tax consultants specializing in tax technology, audit defense, and cross-border WHT compliance. The external consultants provided independent professional perspectives to triangulate and validate the internal findings. Interview data were analyzed thematically, and the identified themes were categorized according to the three gap dimensions established in the conceptual framework.

RESULTS AND DISCUSSION

As-Is Process Mapping

The current WHT reconciliation process at the Company consists of eight sequential manual steps with a total cycle duration of six months per annual reconciliation cycle: (1) GL data extraction; (2) WHT data extraction from SAP; (3) SPT verification and annual recapitulation update; (4) GL cleansing and WHT classification; (5) PI

number matching and payment reconciliation; (6) pivot analysis and variance identification per vendor; (7) material variance investigation and resolution; and (8) supporting document preparation and final report.

The root cause of the process's inadequacy is neither the quality of the underlying data which the Company's SAP system has been well-structured for fifteen years nor the SOP, which is sound, but the manual execution at scale. When classification outcomes depend on which staff member handles a transaction, errors accumulate invisibly across hundreds of thousands of transaction lines until they surface during a DGT tax examination. The five primary bottlenecks are Steps 1, 4, 5, 6, and 7, which together account for most of the cycle duration and carry the highest combined risk ratings across all three gap dimensions.

Gap Analysis

The Gap Analysis confirmed three gap dimensions, validated by all ten informants through triangulation.

The Velocity Gap is the most structurally embedded dimension. A six-month manual cycle is architecturally incompatible with a regulatory environment that requires on-demand data availability. Under PER-8/PJ/2025, DGT auditors arrive at examinations with pre-prepared transaction lists; under PMK 15/2025, companies have a one-month period for submitting documents and five working days to respond, with no extension. The current process, while meeting minimum compliance requirements at present, is not scalable or future-ready under the new regulatory framework.

The Accuracy Gap is rooted in the absence of any systematic mechanism for measuring or tracking WHT classification accuracy. When classification outcomes depend on individual staff knowledge levels, errors accumulate invisibly. External triangulation added a critical dimension: reconciliations that appear too clean may attract more scrutiny, not less, as auditors may suspect data curation rather than genuine reconciliation.

The Audit Readiness Gap is the most legally consequential dimension. Under PMK 15/2025, documentation unavailable at the time of examination cannot be introduced in subsequent objection or appeal proceedings. External consultants confirmed that in severe cases, persistent document unavailability can escalate to a preliminary evidence investigation with criminal tax liability implications. The five-layer traceability standard expected by DGT under Core Tax from SPT through to GL financial recording cannot be produced on demand under the current manual system.

Pareto Analysis and Automation Scope

A Pareto Analysis of five years of historical GL transaction data (2020–2024) across all four WHT articles revealed that just eight GL account codes account for 80.20% of all 308,356 transaction lines. This concentration provides a precisely bounded and analytically validated automation scope: a relatively small set of matching rules can cover most of the reconciliation workload without requiring complete automation of all edge cases before delivering value. The eight primary GL codes include the major expense

categories of contractor services, professional fees, and rental which generate the highest WHT volumes.

To-Be Design

The proposed To-Be solution is a rule-based automated WHT reconciliation system that replaces the current eight-step manual process with a six-stage automated pipeline. The system applies eight primary conditional if-then matching rules targeting the eight GL account codes identified by the Pareto Analysis, using a multi-tier key system: primary matching on Vendor Number and Purchase Order Number, secondary matching on Document Number and Fiscal Year, and tertiary matching on item text field extraction.

The design is explicitly logic-centric and platform-independent (Syed et al., 2020). The conditional matching rules constitute the intellectual core of automation and can be implemented on any rule-based automation platform, migrated to more advanced systems as the Company's digital infrastructure evolves, without requiring fundamental redesign. Unmatched transactions are routed to a structured three-tier exception queue: Timing Differences, Forex Differences, and Permanent Differences each with a documented, reviewable root cause. The output is an on-demand audit-ready reconciliation report with full five-layer traceability from SPT through to GL financial recording.

Predictive Simulation and Cost-Benefit Analysis

The Predictive Simulation applies the Delta Savings formula ($\Delta E = (T_manual - T_automated) \times V$) to the baseline of 1,200 man-hours per year (120 working days × 4 effective hours × average 2.5 persons). With the automated system handling 90% of transactions consistent with the auto-match accuracy rate validated in an external consultant Proof of Concept using the Company's actual GL data the residual man-hours reduce to approximately 120 hours per year. The predicted annual saving is 1,080 man-hours, a 90% reduction, equivalent to Rp 70.2 million per year at the blended payroll rate of Rp 65,000 per hour.

The Cost-Benefit Analysis presents three scenarios to account for uncertainty in the proportion of historical audit findings that automation will prevent in practice. Historical WHT audit findings from the Company's tax records (2018–2022) all attributable to misclassification or data mismatches, excluding substantive interpretation disputes averaged Rp 2,207,200,000 per year. Against a one-time implementation cost of Rp 650,000,000 (with no annual maintenance, as the automation platform is already subscribed at the corporate level):

Under the conservative scenario (50% risk reduction), the five-year net benefit reaches Rp 5.2 billion, yielding an ROI of 802.9% with a payback period of seven months. Under the moderate scenario (70%), the five-year net benefit reaches Rp 7.4 billion (ROI 1,142.5%, payback five months). Under the optimistic scenario (90%), consistent with the POC evidence, the five-year net benefit reaches Rp 9.6 billion (ROI 1,482.1%, payback four months). Across all scenarios, the dominant benefit driver is audit risk reduction rather than man-hours savings, fundamentally reframing the automation

initiative from an operational efficiency project into a financially justified compliance risk mitigation measure.

CONCLUSION

This study demonstrates that the Company's transition from manual to automated withholding tax (WHT) reconciliation represents not merely an operational efficiency initiative but a strategic transformation in tax compliance management. The regulatory changes introduced by PER-8/PJ/2025 and PMK 15/2025 have increased the urgency of this transition, as the existing six-month manual reconciliation cycle presents significant challenges in meeting the one-month document submission and five-working-day audit response periods and supporting the timely retrieval of transaction-level documentation under the Core Tax Administration System (Coretax).

The findings indicate that the proposed automation was supported by analytical evidence, technical feasibility, and favorable financial projections. Pareto analysis identified eight general ledger (GL) codes accounting for 80.20% of transaction volume, establishing a clearly defined scope for automation. An external consultant's proof of concept (POC), conducted using the Company's actual transaction data, demonstrated a 90% automatic matching accuracy rate. Financial projections indicated a five-year return on investment (ROI) ranging from 802.9% to 1,482.1% across the evaluated scenarios. The proposed implementation was estimated to require six months, including a mandatory logic validation stage during which reconciliation and matching rules would be formally reviewed and approved before technical development commenced.

The proposed solution adopted a platform-independent, rule-based architecture to support scalability and adaptability as the Company's digital capabilities evolved. Beyond improving operational efficiency, the automation was expected to facilitate a transition from reactive, manually intensive compliance procedures toward a proactive, continuously updated, traceable, and audit-ready reconciliation process. Future research should evaluate actual implementation outcomes against the projected performance indicators, particularly matching accuracy, processing time, compliance readiness, and financial returns. Further studies could also apply the Business Process Reengineering (BPR) methodology to WHT reconciliation processes in other large Indonesian corporations to examine the generalizability of Pareto-based automation prioritization and rule-based system design across different organizational and data environments.

FUNDING

This study did not receive any specific funding from governmental institutions, private organizations, or other funding agencies.

CONFLICT OF INTEREST

The authors declare that there are no conflicts of interest related to the conduct of the research, preparation, or publication of this article.

AUTHOR CONTRIBUTION

All authors contributed to the preparation of this article. The first autho (Riris Tamara), was responsible for the conceptualization of the study, data collection and analysis, interpretation of the results, and manuscript preparation. The other authors contributed to the review, editing, and final approval of the manuscript.

GENERATIVE ARTIFICIAL INTELLIGENCE USAGE STATEMENT

The authors declare that no generative artificial intelligence was used in the preparation of this article.

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