

Artificial Intelligence, Digital Tax Administration, Service Training and Tax Employee Performance in Bandar Lampung

Renjani Fitria Dewi¹, Umarudin Kurniawan^{2*}, Nurmala Nurmala³

Politeknik Negeri Lampung, Lampung, Indonesia^{1,2,3}

dewi89857@gmail.com¹, umarkurniawan@polinela.ac.id^{2*}, nurmala@polinela.ac.id³



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Abstract

Purpose: Drawing on the Resource-Based View (RBV), this study investigates the association between employees' perceptions of artificial-intelligence-enabled tax services, digital tax administration, and service training with frontline tax employee performance at two Pratama Tax Offices in Bandar Lampung, Indonesia.

Methods: A quantitative census survey was conducted involving all 26 employees in the service sections of KPP Pratama Bandar Lampung Satu and Dua. Saturated sampling was applied due to the limited population size. Data were collected using 16 Likert-scale items representing four constructs and analyzed using IBM SPSS Statistics 26 through validity and reliability testing, regression diagnostics, multiple regression analysis, t-tests, F-tests, and adjusted R² evaluation.

Results: AI services showed no significant effect on employee performance ($B = -0.043$; $p = .698$), while digital tax administration had a positive and significant effect ($B = 0.596$; $p = .007$). Service training was insignificant ($B = -0.170$; $p = .221$). The model was significant, $F(3,22) = 4.278$, $p = .016$, with an adjusted R² of .282.

Limitations: The study is limited by its small and localized sample, restricting generalizability. Self-reported measures may also introduce response bias.

Conclusion: Digital tax administration represents the strongest performance-related resource, while AI and training require stronger integration with organizational routines.

Contributions: This study contributes to technology and public administration research by demonstrating that RBV resources generate different performance pathways depending on organizational integration and implementation mechanisms.

Keywords: *Artificial Intelligence, Coretax, Digital Tax Administration, Employee Performance, Service Training*

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1. Introduction

Digital transformation changes organizational performance not simply by replacing paper processes with electronic ones, but by altering how information is collected, processed, shared, and converted into service decisions. Digital transformation literature therefore treats technology, organizational

redesign, and workforce capability as interdependent rather than separable domains ([Vial, 2019](#); [Verhoef, Broekhuizen, Bart, Bhattacharya, Dong, Fabian, & Haenlein, 2021](#); [Hanelt, Bohnsack, Marz, & Antunes, 2021](#)). Employee acceptance of new digital applications also depends on perceived usefulness, compatibility, and adoption conditions, as illustrated in JBPD evidence on enterprise application acceptance ([Kadir & Tricahyono, 2023](#)). This perspective is highly relevant to tax administration, where service employees increasingly operate through integrated digital platforms while simultaneously remaining responsible for accuracy, responsiveness, explanation, and taxpayer interaction. The development of human resources must consequently advance alongside technology adoption; the JBPD literature similarly emphasizes that digital-era technology creates new demands for employee capability and organizational adaptation ([Habibillah & Hadjri, 2023](#)).

Artificial intelligence adds another layer to this transformation. Public-sector AI can automate repetitive activity, support information retrieval, classify or prioritize cases, and facilitate interaction through conversational interfaces. Yet the availability of an AI tool does not guarantee performance improvement. Public-sector studies repeatedly show that value depends on organizational readiness, data quality, work-process fit, managerial support, employee capability, governance, and user trust ([Wirtz, & Müller, 2019](#); [Aoki, 2020](#); [Madan, & Ashok, 2023](#); [Maragno, Tangi, Gastaldi, & Benedetti, 2023](#)). AI implementation is therefore better understood as a capability-building process than as a one-off technology acquisition. Recent evidence also indicates that AI capabilities may improve organizational performance indirectly through automation and insight-generation activities rather than through a simple direct effect ([Mikalef, Lemmer, Schaefer, Ylinen, Fjørtoft, Torvatn, Gupta, & Niehaves, 2023](#)).

Tax administration provides a particularly appropriate setting for examining this problem because it combines high-volume information processing with strict procedural requirements and direct public service. A digital tax ecosystem links taxpayer registration, filing, payment, verification, communication, and internal work processes. A systematic review of digital tax administration argues that successful transformation depends on the interaction between context, stakeholders, technology, and demonstrated results rather than on technology acceptance alone ([Bassey, Mulligan, & Ojo, 2022](#)). In Indonesia, the expansion of electronic filing, billing, registration, and integrated administration has increased the operational importance of employees' ability to work effectively with digital systems. Chatbot and online helpdesk initiatives also illustrate how virtual interaction can complement conventional tax service channels ([Aji, 2022](#)).

The human side of transformation is equally material. Employee competence affects whether digital systems are used as decision aids, routine transaction tools, or merely additional administrative layers. According to [Blanka, Krumay, and Rueckel \(2022\)](#), research on digital transformation highlights the reciprocal relationship between employee competencies and organizational digital maturity, while public-sector studies identify hybrid competencies such as data literacy, domain knowledge, critical thinking, teamwork, and stakeholder engagement as important for data-driven work ([Dingelstad, Borst, & Meijer, 2022](#)). Digital human-resource development must therefore combine technical learning with work design, transfer of training, and organizational support ([Thite, 2022](#); [Ahmed, Hizam, & Sentosa, 2022](#)).

The source study was conducted among service-section employees at KPP Pratama Bandar Lampung Satu and KPP Pratama Bandar Lampung Dua. It positions three internal resources as potential antecedents of employee performance: perceptions of AI-enabled service support, the implementation of digital tax administration, and service training. All 26 service employees in the two offices were included through saturated sampling. The design is therefore a census of the defined local population rather than a sample intended to represent all Indonesian tax employees. This distinction is important because a small, complete local census may describe its two offices well while still providing limited external generalizability.

The empirical puzzle is also substantively interesting. Employees evaluated all four constructs positively, with mean item scores ranging from 4.14 for AI to 4.74 for employee performance, yet

only digital tax administration produced a statistically significant partial coefficient. AI and service training were not significant once the three predictors were entered simultaneously, even though the overall model was significant. This pattern challenges a simplistic narrative that more technology or more training automatically produces higher employee performance. It instead invites a capability-based interpretation in which resources create value only when they are embedded in routines, complementary skills, and organizational processes ([Barney, 1991](#); [Karim, Nahar, & Demirbag, 2022](#); [Chen, Esperança, & Wang, 2022](#)).

Accordingly, this article asks four questions: whether AI-enabled tax-service perceptions are associated with tax employee performance; whether digital tax administration is associated with performance; whether service training is associated with performance; and whether the three resources are jointly associated with performance. The central research gap is that digital-transformation and public-sector studies often discuss technology, organizational capability, or employee development separately, while tax-service evidence that examines these resources together at the employee level remains limited. The objective is therefore to test the three partial relationships and their joint model while preserving the measurement boundaries of the source thesis. The article contributes in three ways. First, it reframes the thesis evidence in a digital-service and technology-in-business context that fits the transformation emphasis of JBPD. Second, it distinguishes broad AI capability from the source instrument's narrower operationalization through Live Chat Kring Pajak, thereby avoiding an overclaim that Coretax itself is equivalent to AI. Third, it reports measurement and diagnostic caveats explicitly, including the small census, the marginal reliability of the performance construct under a conventional .70 threshold, and the use of Monte Carlo significance in the residual-normality test. The novelty is consequently empirical and contextual: it documents how technological, organizational, and human-capital resources relate to performance among all service employees in two Indonesian tax offices during ongoing digital transformation.

2. Literature Review and Hypotheses Development

2.1 Resource-Based View and digital public-service capability

Resource-Based View (RBV) explains performance differences through heterogeneous resources and capabilities that are valuable and organizationally deployable ([Barney, 1991](#)). In digital settings, the strategic resource is rarely a standalone technology. Meta-analytic evidence shows that information and communication technologies contribute more consistently to performance when they function as enabling resources and are combined with complementary capabilities ([Karim, Nahar, & Demirbag, 2022](#)). Research applying RBV to AI similarly distinguishes the possession of AI tools from an organizational AI capability that combines data, technology, managerial coordination, skills, and routines ([Chen, Esperança, & Wang, 2022](#)).

This distinction is particularly useful for public organizations. [Mikalef, Lemmer, Schaefer, Ylinen, Fjortoft, Torvatn, Gupta, and Niehaves \(2023\)](#) show that AI capability in municipalities affects performance through specific organizational activities such as automation and cognitive insight generation. [Mishra, Ewing, and Cooper \(2022\)](#) likewise demonstrate in a private-sector setting that organizational attention to AI can be related to operating efficiency, but the performance pathway is contingent on how AI is integrated. The implication for a tax office is that AI, digital tax administration, and service training should be treated as potentially complementary resources rather than interchangeable indicators. AI primarily supplies technological functionality and information support; digital tax administration organizes recurring transactions, procedures, and data flows as an organizational capability; and training develops human capital and the ability to transfer knowledge into service behavior. These different locations in the resource configuration explain why their partial coefficients need not be equal: the process capability may be closest to daily work, AI may depend on task-level adoption and governance, and training may depend on transfer climate and supervisory reinforcement.

2.2 Artificial intelligence and tax employee performance

AI applications in public services range from automated processing and prediction to chatbots and decision support. Framework studies identify potential benefits in speed, consistency, scalability, and

information processing, while also highlighting implementation, accountability, and organizational challenges ([Wirtz, & Müller, 2019](#); [Wirtz and Müller, 2019](#); [Wirtz, Langer, & Fenner, 2021](#)). Empirical and review evidence further shows that public-sector AI adoption is constrained by data, technology architecture, employee skills, institutional arrangements, and stakeholder trust ([Sun, & Medaglia, 2019](#); [Madan, & Ashok, 2023](#); [Alhosani, & Alhashmi, 2024](#)).

For frontline service, conversational AI is relevant because it can support rapid responses to repeated questions and extend access to information. [Aoki \(2020\)](#) demonstrates that public trust in AI chatbots depends on context and how the purpose of the tool is communicated. In the Indonesian tax context, [Aji \(2022\)](#) documents the development of a tax helpdesk chatbot, illustrating the operational potential of conversational interfaces. [Maragno, Tangi, Gastaldi, and Benedetti \(2023\)](#) and [Madan and Ashok \(2023\)](#) stress that actual implementation requires alignment between technological affordances and organizational routines. In the source study, the AI construct mainly reflects access to, use of, data-security perceptions of, and virtual-service convenience associated with Live Chat Kring Pajak. It therefore measures an employee-facing perception of an AI-enabled service channel, not the full maturity of an enterprise AI capability.

RBV suggests that a technological resource should contribute to performance when it is sufficiently embedded in the organization and complements other resources. Perceived AI-enabled service support can improve performance through faster information retrieval, more consistent responses, reduced repetitive work, and better access to taxpayer-service information. The mechanism is conditional, however: employees must trust the tool, understand when to use it, and be able to connect its output with authorized procedures and human judgment. The expected relationship is therefore that better perceived AI-enabled tax-service support is associated with better employee performance, although the empirical effect may be weak if the tool remains peripheral to core work routines or is not supported by data, skills, and managerial coordination.

H₁: Perceived AI-enabled tax-service support is significantly associated with tax employee performance

2.3 Digital tax administration and tax employee performance

Digital tax administration is broader than AI. It concerns integrated processes and platforms through which registration, filing, payment, verification, and administrative records are managed. [Bassey, Mulligan, and Ojo \(2022\)](#) conceptualize digital tax administration as an ecosystem in which technology must be aligned with actors, institutional context, and observable results. This is consistent with wider digital-transformation research: organizational outcomes emerge when digital technologies alter processes and operating models rather than merely being introduced as isolated applications ([Vial, 2019](#); [Verhoef, Broekhuizen, Bart, Bhattacharya, Dong, Fabian, & Haenlein, 2021](#); [Hanelt, Bohnsack, Marz, & Antunes, 2021](#)).

The source instrument operationalizes tax administration through employees' reported ability to use Coretax-linked e-Billing, e-Filing, electronic tax-return functions, and e-Registration. These items capture a process capability close to day-to-day service execution. In Indonesian studies, modernization of tax administration has been associated with improved tax-system outcomes ([Sukoyo & Sopiya, 2022](#)). More generally, process digitalization can improve performance when the new digital routines are aligned with organizational capabilities and existing operations ([Yang & Yee, 2022](#)). The mechanism proposed by RBV is operational integration: a reliable administrative system standardizes information flows, reduces avoidable processing errors, and enables employees to complete recurring service tasks more efficiently. Because frontline tax employees repeatedly use administrative processes in their core duties, digital tax administration should have a more proximal relationship with performance than a technology that is used only for selected interactions.

H₂: Digital tax administration is significantly and positively associated with tax employee performance

2.4 Service training and tax employee performance

Service training represents the human-capital component of the model. Digital transformation creates changing competency requirements, making employee development a continuing organizational process rather than an occasional course ([Thite, 2022](#)). [Blanka, Krumay, and Rueckel \(2022\)](#) show that employee competency and digital transformation reinforce one another, while [Dingelstad, Borst, and Meijer \(2022\)](#) demonstrate that digital public-sector work requires a combination of technical, analytical, social, and domain-specific competencies. Digital dexterity similarly depends on employees' ability and willingness to use digital tools in ways that support organizational goals ([Ahmed, Hizam, & Sentosa, 2022](#)).

Training, however, affects performance only when learning is transferred into work behavior. Recent digital human-resource evidence indicates that technology-enabled HR practices can strengthen employee engagement and performance when they are embedded in organizational routines ([Bandhaso & Pala, 2026](#)). Indonesian tax-related studies also report positive links between training and performance among tax employees or tax volunteers ([Yamin, Mirnasari, & Faithya, 2022](#); [Kristanti, Khasanah, & Pramukty, 2024](#); [Irwan, & Santoso, 2025](#)). The mechanism is human-capital activation: training should improve knowledge, technical and nontechnical competence, communication, and ethical service behavior, but these gains become performance-relevant only when employees have an opportunity to apply them and supervisors reinforce the expected practices. The source instrument captures service transparency, Coretax practice and face-to-face communication, response standards and service ethics, and alignment of training with daily service needs. A positive relationship is therefore theoretically expected, but the incremental effect may disappear if most employees report similarly high training exposure, if learning is not transferred, or if training overlaps strongly with competencies already embedded in administrative routines.

H₃: Service training is significantly associated with tax employee performance

2.5 Integrated resource configuration

RBV does not require each resource to produce a large isolated coefficient. Performance can arise from resource configurations in which technological resources, organizational capabilities, and human capital operate jointly. Public-sector AI research has increasingly emphasized such complementary conditions rather than technological determinism ([Madan & Ashok, 2025](#); [Mikalef et al., 2023](#)). In this configuration, digital administration can provide the process infrastructure, AI can extend information and interaction capacity, and training can support the employee capability needed to operate both resources. Accordingly, the joint model is expected to explain employee performance even if some individual predictors do not remain significant after controlling for the others. A significant joint effect would therefore be interpreted as evidence of an integrated resource configuration, not as proof that each resource independently produces a statistically significant effect.

H₄: AI-enabled tax-service support, digital tax administration, and service training are jointly associated with tax employee performance

3. Research Methodology

This study uses a quantitative cross-sectional census design. The defined population consisted of all employees assigned to the service sections of KPP Pratama Bandar Lampung Satu and KPP Pratama Bandar Lampung Dua. Preliminary observation identified 13 employees in each office, giving a total local population of 26. Saturated sampling was used because the target population was small, clearly bounded, and accessible, and because excluding any eligible service employee would reduce the study's coverage of the two offices. All 26 questionnaires were returned, met the study criteria, and were included in the analysis. Thus, the analytical N equals the defined population for the two service sections, but it should not be interpreted as a probability sample of tax employees outside those offices. The census provides complete coverage of the local frame and avoids within-frame nonresponse, while the small N necessarily limits statistical power and external validity. Cross-sectional designs measure exposures and outcomes at a single time point and therefore support association-focused inference rather than temporal causal claims ([Setia, 2016](#)).

Primary data were collected face to face using a structured questionnaire. Each construct contained four statements and used a five-point Likert response scale from 1 (strongly disagree) to 5 (strongly agree). The employee-performance construct covered work quality, timeliness, teamwork, and effectiveness/efficiency. The AI construct covered online-portal accessibility, use of Live Chat Kring Pajak in service work, perceived data security, and virtual-service convenience. Digital tax administration covered Coretax-related e-Billing, e-Filing, electronic tax-return processing, and e-Registration. Service training covered public-service quality, technical and nontechnical competence, service ethics/professionalism, and alignment of training with daily service needs.

Ethical and consent information is reported conservatively. The source questionnaire identified the researcher, the study topic, and the purpose of requesting respondent participation. However, the source thesis does not document an institutional ethics-approval number or reproduce a separate informed-consent form. The article therefore does not claim formal ethics approval that cannot be verified from the source materials. Before journal submission, the authors should confirm and document the applicable institutional permission, voluntary participation, confidentiality safeguards, and informed-consent procedure.

Construct scores were formed from the four items belonging to each variable, as shown by the total-score variables in the source SPSS output. Descriptive comparisons in this article use the reported item-level means because every construct contains the same number of items and the item-level scale is readily interpretable from 1 to 5. The regression itself uses the total construct scores reported in the source output.

The empirical analysis reported here follows IBM SPSS Statistics 26 because the results tables and appendices are explicitly labeled SPSS 26, even though an earlier methodology draft mentioned another version. Item quality was evaluated through item-to-total Pearson correlations, and internal consistency was evaluated using Cronbach alpha. The source study used a .60 reliability rule; this article reports that criterion while also flagging the performance alpha of .689 as marginal relative to the more conservative .70 convention. Cronbach alpha is treated as an internal-consistency indicator whose interpretation should consider scale characteristics and should not be reduced to a mechanical cutoff alone ([Taber, 2018](#)).

Regression diagnostics included residual normality, multicollinearity, and heteroskedasticity. The normality output reports an asymptotic Kolmogorov–Smirnov p-value of .000 and a Monte Carlo p-value of .080 with a 99% confidence interval of .073–.087. Because the source analysis explicitly relies on the Monte Carlo significance, the article reports $p = .080$ for that diagnostic rather than silently replacing it with the asymptotic result. Multicollinearity was assessed from tolerance and VIF, and heteroskedasticity from Glejser regressions on absolute residuals. Multiple linear regression was then estimated as $Y = \alpha + \beta_1 AI + \beta_2 DTA + \beta_3 ST + \varepsilon$. Statistical significance was evaluated at 5%. Given the cross-sectional self-report design, regression coefficients are interpreted as conditional associations, not causal effects.

Table 1. Census and respondent composition

Element	Result
Defined population	Service-section employees, KPP Pratama Bandar Lampung Satu and Dua
Sampling design	Saturated sampling / census
Office composition	13 employees per office
Questionnaires distributed	26
Usable questionnaires	26 (100%)
Analytical unit	Individual service employee

Table 1 clarifies that the study covers the complete employee population defined for the two service sections. The 100% usable-response rate avoids nonresponse within that local frame, but it does not

create representativeness beyond the two offices.

Table 2. Construct operationalization

Construct	Operational indicators	Items
Employee performance (Y)	Work quality; timeliness; teamwork; effectiveness and efficiency	4
AI-enabled service support (X_1)	Portal accessibility; Live Chat Kring Pajak use; perceived data security; virtual-service convenience	4
Digital tax administration (X_2)	Coretax-linked e-Billing; e-Filing; electronic tax-return processing; e-Registration	4
Service training (X_3)	Public-service quality; technical/nontechnical competence; ethics/professionalism; needs alignment	4

Table 2 summarizes the constructs as they were actually measured. In particular, the AI construct is intentionally described as AI-enabled service support because its items focus on Live Chat Kring Pajak rather than the broader organizational AI capability discussed in international literature.

4. Results and Discussions

4.1 Respondent Profile and Descriptive Statistics

All 26 questionnaires were usable, yielding a 100% response and analysis rate within the defined census. Women represented 69% of respondents and men 31%. Educational backgrounds were D1 (7.7%), D3 (34.6%), D4/S1 (46.2%), and S2 (11.5%). The census is therefore dominated by employees with tertiary education, particularly D4/S1, which is relevant because digital administrative work depends on a combination of domain and digital competencies.

Table 3. Respondent profile and descriptive statistics

Measure	Category / Statistic	Value
Gender	Male	8 (31.0%)
	Female	18 (69.0%)
Education	D1	2 (7.7%)
	D3	9 (34.6%)
	D4/S1	12 (46.2%)
	S2	3 (11.5%)
AI-enabled service support	Mean (SD)	4.14 (.875)
Digital tax administration	Mean (SD)	4.68 (.612)
Service training	Mean (SD)	4.47 (.836)
Employee performance	Mean (SD)	4.74 (.540)

Table 3 summarizes construct-level descriptive statistics using the item-scale means reported in the thesis. Employee performance had the highest mean (4.74), followed by digital tax administration (4.68), service training (4.47), and AI (4.14). AI also had the highest standard deviation (.875), indicating greater heterogeneity in how employees perceived or used the AI-enabled service channel. The high means on administration, training, and performance suggest possible ceiling effects: when most respondents select high categories, the remaining variance available to explain individual differences becomes limited.

4.2 Measurement Quality and Regression Diagnostics

All item-to-total correlations were reported as valid in the source study. The observed ranges were .872–.896 for AI, .823–.945 for digital tax administration, .734–.943 for service training, and .660–.871 for employee performance. Cronbach's alpha was .905 for AI, .897 for digital tax administration, .810 for service training, and .689 for employee performance. The first three values indicate strong internal consistency. The performance alpha passes the source study's .60 criterion but sits just below .70; consequently, conclusions involving the dependent construct should be

interpreted with modest measurement caution rather than presenting reliability as unequivocally strong.

The source diagnostics did not indicate major regression-assumption problems under the criteria used. The Monte Carlo residual-normality p-value was .080. VIF values ranged from 1.714 to 2.715 and tolerance from .368 to .583, which does not suggest problematic linear dependence among the predictors. Glejser p-values were .747 for AI, .075 for digital tax administration, and .072 for service training. The latter two are close to .05 but remain above the source threshold; therefore heteroskedasticity was not detected by that test. These diagnostics support use of the reported OLS model while not eliminating the limitations arising from small N and self-report measurement. Table 4 summarizes the measurement-quality and regression-diagnostic evidence used to evaluate these prerequisites.

4.3 Regression Results and Hypotheses Tests

Table 5. Multiple regression estimates

Predictor	B	SE	Beta	t	p
Constant	11.577	2.317	—	4.996	<.001
AI-enabled service support	-.043	.110	-.087	-.393	.698
Digital tax administration	.596	.202	.826	2.959	.007
Service training	-.170	.135	-.296	-1.260	.221

Table 5 presents the multiple-regression estimates. AI has a small negative coefficient ($B = -.043$) and is not significant ($p = .698$), so H_1 is not supported. Digital tax administration has a positive coefficient ($B = .596$) and is significant ($p = .007$), supporting H_2 . Service training has a negative coefficient ($B = -.170$) but is not significant ($p = .221$), so H_3 is not supported. The negative signs for AI and training should not be interpreted as evidence that either resource reduces performance because both coefficients are statistically indistinguishable from zero in this sample.

The overall model is significant, $F(3,22) = 4.278$, $p = .016$, with $R = .607$, $R^2 = .368$, and adjusted $R^2 = .282$. H_4 is therefore supported. After adjustment for three predictors and the small census size, the model explains 28.2% of the observed variation in employee performance, leaving 71.8% associated with variables outside the model and unexplained error. The standardized coefficient for digital tax administration ($\beta = .826$) is much larger than those of AI ($\beta = -.087$) and service training ($\beta = -.296$), but with only 26 observations standardized coefficients should be treated as sample-specific rather than stable population rankings.

The estimated equation is $\text{Performance} = 11.577 - 0.043(\text{AI}) + 0.596(\text{Digital Tax Administration}) - 0.170(\text{Service Training}) + \varepsilon$. Because AI and service-training coefficients are nonsignificant, their negative signs are not interpreted substantively. Table 6 summarizes overall model fit and the decisions for H_1 – H_4 .

4.4 AI-Enabled Service Support and Employee Performance

The nonsignificant AI coefficient is consistent with a capability-based view of public-sector technology. An AI application can be available and perceived positively without becoming a performance-generating capability. Public organizations often need complementary data, process redesign, managerial coordination, skills, and trust before AI produces observable performance gains ([Madan, & Ashok, 2023](#); [Maragno, Tangi, Gastaldi, & Benedetti, 2023](#); [Alhosani, & Alhashmi, 2024](#)). [Mikalef, Lemmer, Schaefer, Ylinen, Fjørtoft, Torvatn, Gupta, and Niehaves \(2023\)](#) similarly show that AI capability influences organizational performance through intermediate activities, which means a direct AI-to-performance path can be weak even when AI is useful.

The operationalization is also important. The four AI items mainly refer to Live Chat Kring Pajak, portal access, integration with service work, perceived data security, and response convenience. They do not measure the broader bundle of AI resources normally discussed in capability research, such as

data architecture, analytics talent, machine-learning model governance, managerial orchestration, or organizational learning. The result therefore should be stated narrowly: variation in employees' perception of this AI-enabled service channel did not explain additional performance variation after digital tax administration and training were included. It should not be generalized into a conclusion that AI is irrelevant to tax administration.

This cautious interpretation is consistent with public-sector evidence. AI can improve speed and scalability, but implementation challenges and public trust can condition its value ([Aoki, 2020](#); [Sun, & Medaglia, 2019](#); [Wirtz, & Müller, 2019](#)). [Alhosani and Alhashmi \(2024\)](#) likewise emphasize that government AI innovation offers productivity opportunities while requiring organizational and governance conditions. A practical implication is that KPP management should evaluate AI by task-level outcomes, response time, case resolution, escalation accuracy, employee adoption, and taxpayer satisfaction, rather than by availability alone.

The Indonesian evidence reported in the source thesis supports this conditional interpretation. [Lumban, Marbun, and Napitupulu \(2025\)](#) found that artificial intelligence did not have a significant partial relationship with employee performance, while the broader combination of job satisfaction, motivation, organizational commitment, and AI was significant. [Hidayat and Waskito \(2025\)](#) likewise reported that AI did not significantly affect employee performance individually, although AI and management support were relevant to productivity through a broader model. In a tax-related setting, [Rahayu and Suaidah \(2025\)](#) found that AI-based tax services did not have a direct relationship with taxpayer compliance but operated indirectly through digital literacy. [Amrullah, Cahyadi, and Ramli \(2024\)](#) and [Pramesti and Emalia \(2024\)](#) further describe the potential of AI for tax service and supervision while emphasizing regulatory, infrastructure, and implementation challenges. Taken together, these studies help explain why a favorable perception of Live Chat Kring Pajak may coexist with a nonsignificant employee-performance coefficient: the channel may be useful, but its value is mediated by user capability, managerial support, digital literacy, governance, and integration with the employee's core workflow.

4.5 Digital Tax Administration and Employee Performance

Digital tax administration is the only predictor with a statistically significant partial coefficient. This is substantively plausible because the construct is closest to employees' recurring core work: verifying e-Billing, processing e-Filing, checking electronic tax-return information, and handling e-Registration through Coretax-related routines. Unlike a supplementary chat channel, these functions are embedded in the transaction flow of frontline tax administration. The coefficient therefore reflects a more proximal organizational capability.

The result aligns with the digital-tax ecosystem perspective of [Bassey, Mulligan, and Ojo \(2022\)](#), which places process integration and demonstrated operational outcomes at the center of digital tax administration. It also corresponds with wider transformation research showing that digital technologies create performance when they become part of redesigned processes and organizational routines ([Vial, 2019](#); [Verhoef, Broekhuizen, Bart, Bhattacharya, Dong, Fabian, and Haenlein \(2021\)](#); [Hanelt, Bohnsack, Marz, & Antunes, 2021](#); [Yang, & Yee, 2022](#)). In RBV terms, the value lies not simply in having a digital platform, but in the office's capacity to execute tax processes reliably through it.

Tax-specific evidence provides additional support for the process-integration explanation. [Palar, Maruli, and Pangaribuan \(2024\)](#) relate understanding of digital tax-administration systems to digital transformation and tax compliance, while [Sari, Rossanti, Aulia, Nisa, and Annisa \(2025\)](#) report that Coretax implementation is related to the effectiveness of employee work in tax management, subject to technical-training and network constraints. [Rahmawati and Nurcahyani \(2025\)](#) discuss Coretax as part of tax-administration reform, and [Utama and Yuliana \(2025\)](#) connect Coretax implementation with employee efficiency at the Directorate General of Taxes. These studies do not make the present cross-sectional coefficient causal, but they reinforce the interpretation that digital administration

becomes performance-relevant when it structures the actual flow of work rather than merely adding another available application.

The finding should nevertheless be interpreted as an association, not proof that improving Coretax skills by one unit causes a .596-unit performance increase. Both the predictor and outcome are self-reported in the same questionnaire, and high mean scores can create common-method covariance. The appropriate managerial reading is that employees who report stronger digital-administration capability also report stronger performance after the other two predictors are held constant. This makes administration a priority area for workflow support, system usability, data quality, and task-specific competence.

4.6 Service Training and Employee Performance

Service training was positively perceived descriptively but did not have a significant incremental association with performance. This difference between favorable training evaluations and regression significance is important. Training exposure does not automatically translate into work performance; transfer depends on training design, relevance to actual tasks, opportunity to apply learning, supervisory reinforcement, and the surrounding work system. Evidence on digital human-resource management shows that digitally enabled HR practices can support employee performance through stronger employee engagement ([Bandhaso & Pala, 2026](#)), while digital-HRD research stresses that competency development must be embedded in ongoing transformation rather than delivered as detached learning events ([Thite, 2022](#); [Blanka, Krumay, & Rueckel, 2022](#)).

The local literature also provides a useful contrast. [Yamin, Mirnasari, and Faithya \(2022\)](#), [Kristanti, Khasanah, and Pramukty \(2024\)](#), and [Irwan and Santoso \(2025\)](#) report positive training-performance relationships in tax-related settings. The current result does not invalidate those studies; it suggests that in this 26-person census, training did not explain additional variance after administration and AI perceptions were controlled. The high training mean (4.47) and limited dispersion may reduce statistical discrimination, while the four items combine different dimensions, transparency, coretax practice, communication, ethics, and needs alignment that may not transfer to performance uniformly.

The source thesis also provides a useful comparison with studies that do not find a direct training effect. [Khristian, Munir, Daud, and Fauzan \(2025\)](#) report that training was not significant for employee performance when training remained too theoretical or lacked effective follow-up, even though training and competence were jointly relevant to performance. [Mappadang, Indrabudiman, Sinaga, and Handayani \(2023\)](#) show that tax training and e-Filing assistance can improve participants' knowledge and understanding, and [Kristanti et al. \(2024\)](#) find significant relationships for training materials, service ethics, and volunteer competence in a tax-center setting. The contrast indicates that training outcomes depend on program design, transfer opportunities, work routines, and the population being studied. For the present census, the high training mean of 4.47 and the limited dispersion may also reduce the ability of a small regression model to distinguish which aspects of training translate into performance differences.

For practice, training should be evaluated using pre/post task evidence and transfer metrics rather than satisfaction alone. Modules can be linked to concrete service scenarios, Coretax error patterns, taxpayer communication, and escalation cases. Digital competence research suggests that public employees require hybrid skill sets combining technical capability, domain expertise, critical judgment, teamwork, and stakeholder engagement ([Dingelstad, Borst, & Meijer, 2022](#)). Training that develops this combination is more likely to complement digital administration effectively.

4.7 Joint Model, RBV Interpretation, and JBPD Relevance

The significant F test supports an integrated interpretation: the three resources contain joint information about employee performance even though only digital tax administration is significant individually. RBV allows this result because resources can be complementary and because the value of one resource depends on how it is organized with others. AI-focused studies using RBV likewise emphasize orchestration and complementarity rather than technological determinism ([Chen, Esperança, & Wang, 2022](#); [Karim, Nahar, & Demirbag, 2022](#); [Mishra, Ewing, & Cooper, 2022](#)). This

configuration is also consistent with the local evidence discussed in the source thesis: AI may need management support and organizational commitment, training may need competence and transfer mechanisms, and digital administration may provide the process structure through which both resources become usable. The joint significance should therefore be read as evidence that the resource bundle is relevant to performance in this local setting, not as evidence that every component has an independent effect.

The adjusted R^2 of .282 is moderate and leaves substantial room for other determinants. Work motivation, leadership, organizational culture, workload, service climate, system stability, role clarity, and prior experience could plausibly explain additional variance. The source thesis itself recommends expanding future models in these directions. This residual variance is not a weakness to be hidden; it prevents the article from overstating three digital-resource variables as a complete theory of employee performance.

For JBPD, the study's relevance lies in technology-in-business and Industry 4.0 rather than conventional digital marketing. A tax office is a public-service organization, but its service model increasingly relies on digital platforms, integrated information systems, and technology-enabled interaction. The evidence suggests that digital transformation should be managed as a portfolio of technological resources, operating capabilities, and employee development. This is consistent with research showing that digital capabilities and organizational capabilities jointly shape performance outcomes ([Ahmed, Hizam, & Sentosa, 2022](#); [Habibillah, & Hadjri, 2023](#)). Recent Goodwood studies similarly show that digitalization and employees' technical capability can shape work effectiveness ([Putri & Abriand, 2024](#)), while digital-transformation initiatives benefit from explicit strategic prioritization rather than technology deployment in isolation ([Akmal, 2025](#)). Table 7 translates the empirical findings into practical digital-service priorities.

5. Conclusions

5.1 Conclusion

This study examined AI-enabled tax-service support, digital tax administration, and service training in relation to tax employee performance using a census of 26 service employees from two KPP Pratama offices in Bandar Lampung. AI was not significant ($B = -.043$, $p = .698$), digital tax administration was positive and significant ($B = .596$, $p = .007$), and service training was not significant ($B = -.170$, $p = .221$). The joint model was significant, $F(3,22) = 4.278$, $p = .016$, with adjusted $R^2 = .282$. The results therefore support H_2 and H_4 , while H_1 and H_3 are not supported.

The substantive implication is not that AI and training are unimportant. The source AI instrument measures a narrow service-channel perception rather than enterprise AI capability, and training may influence performance through transfer mechanisms or competencies not captured by the current cross-sectional specification. Digital tax administration shows the clearest incremental association because it is embedded directly in recurring service tasks. The evidence therefore favors a capability-integration strategy: strengthen core digital administrative routines, connect AI tools to measurable service workflows, and redesign training around task transfer and digital-public-service competencies. This interpretation preserves the distinction between statistical non-significance and practical uselessness, which is especially important in a localized census with limited statistical power.

Theoretical contribution. The study extends the RBV discussion into a public tax-service setting by showing that technological resources, organizational capabilities, and human capital can occupy different positions in the performance pathway. The significant coefficient for digital tax administration is consistent with a resource that is embedded in recurring processes, whereas the nonsignificant coefficients for AI-enabled service support and training indicate that availability or favorable perception is not sufficient for direct performance association. The theoretical contribution is therefore a contextual explanation of resource complementarity and differentiated mechanisms, not a claim that the result represents all tax offices or all public organizations.

Managerial implications. For KPP management, the results support prioritizing reliability, usability, data quality, and employee support in Coretax-related workflows. AI should be assigned to defined service tasks and evaluated through response time, resolution accuracy, escalation quality, employee adoption, and taxpayer-service outcomes. Training should use actual service scenarios, hands-on practice, coaching, and post-training transfer measures. These recommendations follow the observed association pattern while recognizing that the study does not establish causal effects.

5.2 Research Limitations

Several limitations constrain inference. First, the study is a census of only 26 employees from two service sections in one city. It is complete for the defined local population but too narrow for broad statistical generalization. Second, the design is cross-sectional and observational, so regression coefficients do not establish causality. Third, predictors and outcome were collected from the same respondents at the same time, creating potential common-method and social-desirability bias. Fourth, all constructs have high means, especially performance (4.74), creating potential ceiling effects and restricted variance.

Fifth, the employee-performance alpha is .689. This meets the source study's .60 rule but falls slightly below a stricter .70 benchmark, so measurement precision is not ideal. Sixth, the AI construct primarily captures Live Chat Kring Pajak and related virtual-service perceptions; it should not be interpreted as a complete measure of AI capability or of Coretax. Seventh, no control variables were included and statistical power is limited with $N = 26$. Finally, the source thesis does not provide a formal ethics-approval number or a reproduced informed-consent form; the authors should verify institutional and participant-consent documentation before submission if required by the journal or institution.

5.3 Suggestions and Directions for Future Research

Future studies should expand across KPP offices and use larger multi-site samples, preferably with longitudinal or repeated-measures designs that can observe changes before and after system or training interventions. AI should be measured as a multidimensional capability including data quality, model functionality, task integration, governance, employee skill, managerial support, and realized use. Digital tax administration can be decomposed into system quality, information quality, process integration, usability, and service outcomes. Training studies should include training-needs analysis, transfer climate, supervisory support, opportunity to apply learning, and objective post-training performance.

For management, the immediate priority is to protect and strengthen the administrative capability that already shows a significant relationship with performance. System support should focus on transaction accuracy, error resolution, response times, and interoperability across e-Billing, e-Filing, tax-return processing, and registration. AI tools should be connected to defined service tasks and monitored with adoption and outcome metrics. Training should shift from generic delivery toward scenario-based practice using actual service problems, with follow-up coaching and transfer evaluation.

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Author Contributions

RFD contributed to the conceptualization, investigation, data curation, formal analysis, and preparation of the original draft. UK contributed to supervision, methodology review, validation, and manuscript review and editing. NN contributed to supervision, validation, and manuscript review and editing. All authors have reviewed, verified their respective contributions, and approved the final version of the manuscript for submission.

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