THE IMPACT OF ARTIFICIAL INTELLIGENCE AND ROBOTIC PROCESS AUTOMATION ADOPTION ON ACCOUNTANTS' PERFORMANCE: THE MEDIATING ROLE OF DIGITAL COMPETENCE

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Abstract
The rapid adoption of emerging digital technologies is transforming the accounting profession and changing the skills and capabilities required of accounting professionals. Artificial Intelligence (AI) and Robotic Process Automation (RPA) have become increasingly important technologies for automating routine accounting activities, improving process efficiency, reducing errors, and supporting professional decision-making. However, the extent to which the adoption of these technologies translates into improved accountants' performance may depend on accountants' ability to effectively utilize digital technologies. Accordingly, this study aims to examine the impact of AI and RPA adoption on accountants' performance and to investigate the mediating role of digital competence in these relationships. The study proposes an integrated conceptual model in which AI adoption and RPA adoption represent the independent variables, digital competence represents the mediating variable, and accountants' performance represents the dependent variable. The proposed model is intended to provide empirical evidence on how technological adoption contributes to accounting professionals' performance and whether digital competence represents an important mechanism through which these technologies generate professional value. The study is expected to contribute to the accounting literature by integrating technological adoption and human digital capabilities within a single analytical framework and to provide practical implications for organizations, accounting firms, and professional institutions seeking to enhance accountants' performance in increasingly digital work environments.

1. Introduction

The rapid development of digital technologies is transforming the accounting profession and changing the nature of accountants' work. Accounting is no longer limited to recording transactions and preparing financial reports; instead, accounting professionals increasingly rely on digital technologies to process and analyze information, improve operational efficiency, and support professional decision-making. This digital transformation has consequently changed the nature of accounting activities and increased the range of technological, analytical, and professional capabilities required of modern accountants (Castanheira & Loureiro, 2026).

Among the most influential technologies contributing to this transformation are Artificial Intelligence (AI) and Robotic Process Automation (RPA). Artificial Intelligence enables accounting professionals to process and analyze large volumes of data, identify patterns and anomalies, support forecasting and decision-making, and assist in areas such as fraud detection and risk analysis. More broadly, AI applications in organizations have been used to automate business processes, generate cognitive insights, and support human decision-making (Davenport & Ronanki, 2018). In contrast, RPA is primarily designed to automate repetitive, structured, and rule-based processes, including data entry, invoice processing, reconciliations, and the transfer of information between different systems. Previous research in public accounting has demonstrated the increasing application of RPA

for automating standardized accounting processes and improving operational efficiency (Cooper et al., 2019). Therefore, both AI and RPA have considerable potential to improve accounting processes by increasing efficiency, reducing processing time, minimizing errors, and allowing accountants to focus on higher-value professional activities (Abdo-Salloum & Chehade, 2026; Castanheira & Loureiro, 2026).

The adoption of these technologies is contributing to a gradual transformation of accounting work from routine transaction processing toward more analytical, strategic, and value-adding activities. Rather than spending a substantial proportion of their time performing repetitive tasks, accountants can increasingly devote their efforts to analyzing financial information, interpreting results, providing professional advice, and supporting managerial decision-making. Recent literature indicates that AI and RPA are becoming important components of digital transformation in accounting, with increasing attention being given to their effects on efficiency, process quality, and professional practices (Castanheira & Loureiro, 2026).

However, the adoption of digital technologies does not necessarily guarantee improved accountants' performance. The extent to which organizations and accounting professionals benefit from AI and RPA may depend on accountants' ability to understand, use, evaluate, and effectively integrate these technologies into their professional activities. Consequently, digital competence has emerged as an increasingly important capability for accounting professionals operating in technology-intensive work environments (Satjawisate et al., 2025; Tiron-Tudor et al., 2025).

Digital competence extends beyond the basic ability to operate digital tools. It includes the ability to access, process, analyze, and evaluate digital information, select appropriate technologies for professional tasks, solve problems using digital tools, critically evaluate technology-generated outputs, and adapt to emerging technologies. These capabilities are particularly important in accounting because technological systems increasingly perform activities that were traditionally undertaken manually by accounting professionals (Satjawisate et al., 2025).

The importance of digital competence has increased as accounting organizations have adopted advanced technologies, automated systems, data analytics, and intelligent applications. Modern accountants are increasingly expected to combine traditional accounting knowledge with technological, analytical, problem-solving, and critical-thinking skills. Recent research emphasizes that digital transformation is changing professional roles and increasing the demand for advanced digital and technological competencies among accounting professionals (Satjawisate et al., 2025; Tiron-Tudor et al., 2025).

Recent empirical evidence also suggests that AI-related knowledge and competencies can contribute to accountants' analytical capabilities, adaptability, critical thinking, and decision-making skills. This indicates that the professional value generated by AI is not determined exclusively by the technological capabilities of the systems themselves but also by the human capabilities of those who use and interpret them (Imjai et al., 2025).

Despite the growing body of research on AI, RPA, and digital competencies in accounting, important questions remain regarding the relationship between technological adoption and accountants' professional performance. Previous studies have frequently examined AI, RPA, or digital competencies separately, while other studies have focused on technology adoption, AI literacy, technological readiness, or the competencies required by accounting students and professionals. Comparatively less attention has been devoted to examining AI adoption and RPA adoption simultaneously and determining how these technologies contribute to the performance of practicing accountants (Castanheira & Loureiro, 2026; Satjawisate et al., 2025).

Furthermore, limited empirical attention has been given to the mechanism through which technological adoption may translate into improved professional performance. Although digital competence is increasingly recognized as an important requirement for accountants, there remains a need to examine whether it acts as a mechanism through which the adoption of AI and RPA contributes to better professional outcomes (Satjawisate et al., 2025).

The increasing use of AI in accounting and auditing reflects a broader shift toward automation and intelligent decision-support systems, with earlier studies highlighting the potential of AI to transform professional accounting and auditing activities (Sutton et al., 2016; Kokina & Davenport, 2017). More broadly, AI has been applied in organizations to automate processes, generate cognitive insights, and support human decision-making (Davenport & Ronanki, 2018).

Accordingly, the present study focuses on the relationships between AI adoption, RPA adoption, digital competence, and accountants' performance. Specifically, the study proposes that AI adoption and RPA adoption may directly improve accountants' performance while also contributing to the development of digital competence. In turn, higher levels of digital competence may enable accountants to use digital technologies more effectively and consequently improve their professional performance.

Therefore, this study seeks not only to determine whether AI and RPA adoption are associated with improved accountants' performance but also to examine how such technological adoption may generate professional value through digital competence. By integrating technological adoption and human digital capabilities within a single analytical framework, the study aims to contribute to the emerging literature on digital transformation in accounting (Castanheira & Loureiro, 2026; Satjawisate et al., 2025).

The findings of the study are expected to provide theoretical and practical implications. From a theoretical perspective, the study contributes to understanding the interaction between technological adoption, human capabilities, and professional performance. From a practical perspective, the findings may assist organizations, accounting firms, and professional institutions in developing appropriate digital training and competency-development programs that enable accountants to obtain greater value from AI and RPA technologies (Tiron-Tudor et al., 2025).

1.1. Research Problem

The increasing adoption of Artificial Intelligence (AI) and Robotic Process Automation (RPA) is transforming accounting work by automating routine activities, improving efficiency, reducing errors, and supporting decision-making (Abdo-Salloum & Chehade, 2026; Castanheira & Loureiro, 2026).

However, the adoption of these technologies does not necessarily guarantee improved accountants' performance. Their effectiveness may depend on accountants' ability to understand, use, evaluate, and integrate digital technologies into their professional activities (Satjawisate et al., 2025).

The digital transformation of accounting has consequently increased the importance of digital competence, including technological, analytical, problem-solving, and digital information-management skills. Recent research indicates that the accounting profession is experiencing increasing demand for digital, technological, and analytical competencies (Satjawisate et al., 2025; Tiron-Tudor et al., 2025).

Although previous studies have examined AI, RPA, and digital competencies in accounting, limited empirical research has examined these variables simultaneously, particularly among practicing accountants (Castanheira & Loureiro, 2026).

Moreover, insufficient attention has been given to the mechanism through which AI and RPA adoption may improve accountants' performance. In particular, the mediating role of digital competence remains insufficiently examined.

Therefore, the central research problem of this study is the limited empirical understanding of how AI and RPA adoption influence accountants' performance and whether digital competence mediates these relationships.

1.2. Research Gap

The recent accounting literature has increasingly examined digital transformation, AI, RPA, and the changing competencies required by accounting professionals. Nevertheless, several important gaps remain.

1.2.1. integration gap exists.

Previous research has frequently examined AI and RPA as separate technologies. Although recent literature has reviewed digital technologies within accounting and auditing, empirical studies that simultaneously examine AI adoption and RPA adoption and their effects on professional accountants' performance remain limited (Castanheira & Loureiro, 2026).

1.2.2. Performance-outcome gap exists.

A considerable part of recent research has focused on technology adoption, AI literacy, technological readiness, or educational outcomes. For example, Imjai et al. (2025) examined AI literacy and related capabilities among prospective Thai accountants, while other recent research has examined AI literacy and related capabilities among accounting students. These studies provide important evidence concerning future accounting professionals but do not directly examine the performance of practicing accountants in organizational settings (Imjai et al., 2025).

1.2.3. Mediation/mechanism gap exists.

Recent literature recognizes digital competence as an increasingly important requirement for the accounting profession. Satjawisate et al. (2025) identified digital competencies as an important issue in the transformation of the accounting profession. However, limited empirical evidence has examined digital competence as a mediating mechanism through which AI and RPA adoption may influence accountants' professional performance (Satjawisate et al., 2025).

1.2.4. Professional-accountant gap exists.

Several empirical studies have focused on accounting students and prospective accountants. For example, Imjai et al. (2025) investigated AI literacy among prospective Thai accountants. This creates an opportunity to extend the literature by examining professional accountants who are directly exposed to AI and RPA within actual accounting work environments.

1.2.5. Human–technology gap exists.

Existing literature increasingly recognizes that technological transformation does not depend exclusively on the availability of technology. Rather, effective use of AI and automation requires appropriate human competencies. Recent research emphasizes that digital transformation is accompanied by changes in professional roles, skills, and responsibilities (Satjawisate et al., 2025; Tiron-Tudor et al., 2025).

Therefore, the key research gap addressed by the present study is the lack of an integrated empirical model that simultaneously examines AI adoption and RPA adoption as technological antecedents, digital competence as a mediating human capability, and accountants' performance as a professional outcome.

The study consequently seeks to answer the following research question: How does the adoption of AI and RPA translate into improved accountants' performance, and to what extent does digital competence explain this relationship?

This represents the principal contribution of the study. Rather than examining only whether AI and RPA improve accounting performance, the study investigates the mechanism through which technological adoption may be transformed into improved professional performance.

1.3. Research Hypotheses

H1: AI adoption has a positive effect on accountants' performance.

AI can improve accountants' performance by increasing work efficiency, supporting data analysis, identifying anomalies, and assisting professional decision-making (Abdo-Salloum & Chehade, 2026; Castanheira & Loureiro, 2026).

H2: RPA adoption has a positive effect on accountants' performance.

RPA can enhance accountants' performance by automating repetitive and rule-based tasks, reducing processing time, and allowing accountants to focus on higher-value activities (Castanheira & Loureiro, 2026).

H3: AI adoption has a positive effect on digital competence.

The use of AI may increase accountants' exposure to advanced digital technologies and strengthen their ability to use, interpret, and critically evaluate technology-supported information (Satjawisate et al., 2025; Imjai et al., 2025).

H4: RPA adoption has a positive effect on digital competence.

RPA adoption may strengthen accountants' digital competence through increased experience with automated systems, digital workflows, and technology-supported accounting processes (Castanheira & Loureiro, 2026; Satjawisate et al., 2025).

H5: Digital competence has a positive effect on accountants' performance.

Accountants with higher digital competence may be better able to use digital technologies, analyze digital information, solve technology-related problems, and adapt to changing professional requirements (Satjawisate et al., 2025; Tiron-Tudor et al., 2025).

H6: Digital competence mediates the relationship between AI adoption and accountants' performance.

This hypothesis proposes that AI adoption improves accountants' performance partly through the development and application of digital competence.

H7: Digital competence mediates the relationship between RPA adoption and accountants' performance.

This hypothesis proposes that RPA adoption improves accountants' performance partly through the development and application of digital competence.

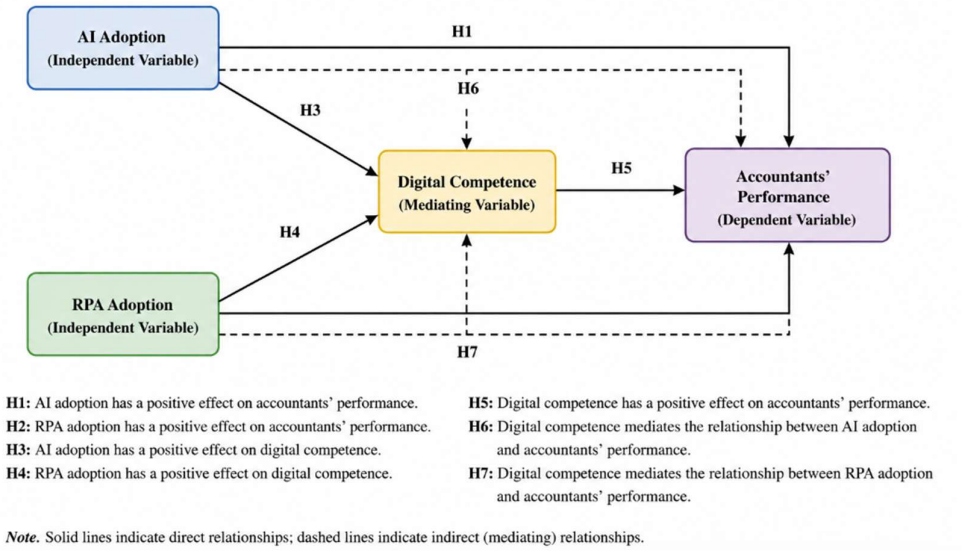


Figure 1. The Proposed Conceptual Framework

1.4. Research Objectives

Main Objective: to examine the impact of Artificial Intelligence (AI) and Robotic Process Automation (RPA) adoption on accountants' performance and to investigate the mediating role of digital competence.

Specific Objectives: 1) To examine the effect of AI adoption on accountants' performance. 2) To examine the effect of RPA adoption on accountants' performance. 3) To examine the effect of AI adoption on accountants' digital competence. 4) To examine the effect of RPA adoption on accountants' digital competence. 5) To examine the effect of digital competence on accountants' performance. 6) To investigate whether digital competence mediates the relationship between AI adoption and accountants' performance. 7) To investigate whether digital competence mediates the relationship between RPA adoption and accountants' performance.

2. Method

2.1. Research Approach

This study adopts a quantitative research approach to examine the relationships between Artificial Intelligence (AI) adoption, Robotic Process Automation (RPA) adoption, digital competence, and accountants' performance. The quantitative approach is appropriate because the study aims to test theoretically derived hypotheses and examine the relationships among measurable constructs using statistical analysis (Creswell & Creswell, 2018).

2.2. Research Design

A cross-sectional research design is employed in this study. Data are collected from professional accountants at a specific point in time using a structured questionnaire. A cross-sectional design is appropriate for examining relationships among variables within a defined population and provides an efficient approach for collecting quantitative data (Saunders et al., 2019).

2.3. Population and Sample

The target population consists of professional accountants working in accounting firms and organizations. The sampling procedure and sample size should be determined according to the characteristics of the target population, research design, and requirements of the statistical analysis (Saunders et al., 2019).

Because the proposed model is analyzed using PLS-SEM, sample-size considerations should also take into account the complexity of the structural model and the statistical power required to detect the expected relationships (Hair et al., 2022).

2.4. Data Collection Instrument

The study uses a structured questionnaire divided into four main sections: AI Adoption, RPA Adoption, Digital Competence, and Accountants' Performance. The questionnaire items are measured using a five-point Likert scale ranging from 1 = Strongly Disagree to 5 = Strongly Agree.

The measurement items should be adapted from previously established measures where appropriate and reviewed to ensure their relevance to the accounting context. The development and evaluation of measurement scales should consider reliability, validity, and the conceptual definition of each construct (DeVellis & Thorpe, 2021).

Table 1. Questionnaire Sections and Corresponding Variables

Section	Variable
A	AI Adoption
B	RPA Adoption
C	Digital Competence
D	Accountants' Performance

The questionnaire items will be measured using a five-point Likert scale, ranging from 1 = Strongly Disagree to 5 = Strongly Agree.

2.5. Study Variables

The study includes four main constructs. AI Adoption and RPA Adoption are specified as independent variables, Digital Competence is specified as the mediating variable, and Accountants' Performance is specified as the dependent variable.

Table 2. Study Variables and Their Roles in the Research Model

Variable	Role in the Model
AI Adoption	Independent Variable
RPA Adoption	Independent Variable
Digital Competence	Mediating Variable
Accountants' Performance	Dependent Variable

2.6. Data Analysis

The collected data are analyzed using descriptive statistics and Partial Least Squares Structural Equation Modeling (PLS-SEM). PLS-SEM is appropriate for examining complex relationships among latent constructs and for estimating both direct and indirect effects within an integrated structural model (Hair et al., 2022).

The analysis consists of two main stages. First, the measurement model is evaluated to assess the reliability and validity of the constructs. Second, the structural model is assessed to examine the hypothesized relationships among the constructs.

2.7. Measurement Model Assessment

The measurement model is evaluated using internal consistency reliability, convergent validity, and discriminant validity. Cronbach's alpha and composite reliability are used to assess internal consistency reliability, while Average Variance Extracted (AVE) is used to assess convergent validity. Composite reliability values above 0.70 and AVE values above 0.50 generally indicate satisfactory reliability and convergent validity (Hair et al., 2022).

Discriminant validity is assessed using the Heterotrait-Monotrait ratio (HTMT). HTMT is an appropriate criterion for evaluating whether theoretically distinct constructs are empirically distinguishable (Henseler et al., 2015).

2.8. Structural Model Assessment

The structural model is evaluated using the coefficient of determination (R^2), effect size (f^2), predictive relevance (Q^2), and path coefficients. R^2 indicates the proportion of variance in an endogenous construct explained by its predictor constructs. The f^2 statistic is used to assess the contribution of an individual exogenous construct to the R^2 value of an endogenous construct (Hair et al., 2022).

Predictive relevance is assessed using Q^2. Positive Q^2 values indicate predictive relevance under the relevant PLS-SEM predictive-assessment procedure (Hair et al., 2022).

2.9. Hypothesis Testing

The hypotheses are tested using bootstrapping within the PLS-SEM procedure. Bootstrapping provides standard errors, t-values, p-values, and confidence intervals for assessing the statistical significance of structural path coefficients (Hair et al., 2022).

A large number of bootstrap subsamples should be used in the final analysis to obtain stable estimates of the sampling distribution. The exact number should correspond to the settings used in the SmartPLS analysis.

2.10. Mediation Analysis

Digital Competence is examined as a mediating variable in the relationships between AI Adoption and Accountants' Performance and between RPA Adoption and Accountants' Performance.

The indirect effects are assessed using bootstrapping. Mediation is supported when the indirect effect is statistically significant and its bootstrap confidence interval does not include zero (Hair et al., 2022).

The mediation relationships examined in the study are:
AI Adoption → Digital Competence → Accountants' Performance
RPA Adoption → Digital Competence → Accountants' Performance

The type of mediation is determined by considering the significance and direction of the direct and indirect effects.

3. Results and Discussion

3.1. Results

The data analysis was conducted using Partial Least Squares Structural Equation Modeling (PLS-SEM). The analysis included the assessment of the measurement model and structural model. The measurement model was evaluated through reliability, convergent validity, and discriminant validity, while the structural model was assessed using path coefficients, R^2, f^2, Q^2, and hypothesis testing. The evaluation and reporting of PLS-SEM results followed established recommendations concerning measurement-model and structural-model assessment (Hair et al., 2019, 2022). Bootstrapping is appropriate in PLS-SEM for assessing the significance of path coefficients and obtaining t-values and confidence intervals. For final analysis, SmartPLS recommends using a large number of bootstrap subsamples, typically around 10,000.

3.1.1. Reliability and Convergent Validity

Table 3. Reliability and Convergent Validity

Construct	No. of Items	Cronbach's Alpha	Composite Reliability (CR)	AVE
AI Adoption	5	0.912	0.935	0.744
RPA Adoption	5	0.895	0.922	0.704
Digital Competence	6	0.928	0.944	0.737
Accountants' Performance	5	0.901	0.926	0.716

Interpretation: Table 3 presents the reliability and convergent validity results. Cronbach's alpha values range from 0.895 to 0.928, while composite reliability values range from 0.922 to 0.944. All values exceed the commonly recommended threshold of 0.70, indicating satisfactory internal consistency reliability. In addition, the AVE values range from 0.704 to 0.744, exceeding the recommended threshold of 0.50 and indicating satisfactory convergent validity (Hair et al., 2022).

Therefore, the measurement model demonstrates satisfactory internal consistency and convergent validity.

3.1.2. Discriminant Validity

Table 4. Discriminant Validity Using HTMT

Constructs	AI Adoption	RPA Adoption	Digital Competence	Accountants' Performance
AI Adoption	—	0.671	0.728	0.693
RPA Adoption	0.671	—	0.701	0.665
Digital Competence	0.728	0.701	—	0.756
Accountants' Performance	0.693	0.665	0.756	—

Interpretation: Table 4 presents the HTMT results. The HTMT values range from 0.665 to 0.756. All values are below commonly applied threshold levels, indicating satisfactory discriminant validity among the constructs (Henseler et al., 2015; Hair et al., 2022).

These findings indicate that AI Adoption, RPA Adoption, Digital Competence, and Accountants' Performance represent empirically distinguishable constructs.

3.1.3. Coefficient of Determination

Table 5. Coefficient of Determination (R^2)

Endogenous Construct	R^2	Interpretation
Digital Competence	0.420	Moderate
Accountants' Performance	0.580	Moderate/Substantial

Interpretation: Table 5 shows that AI Adoption and RPA Adoption jointly explain 42.0% of the variance in Digital Competence. Furthermore, AI Adoption, RPA Adoption, and Digital Competence collectively explain 58.0% of the variance in Accountants' Performance.

Rather than assigning a rigid categorical interpretation to the R^2 values, the results indicate that the proposed model explains a meaningful proportion of variance in both endogenous constructs. The interpretation of R^2 should ultimately consider the research context and the complexity of the model (Hair et al., 2022).

3.1.4. Effect Size

Table 6. Effect Size (f^2)

Structural Relationship	f^2	Effect
AI Adoption → Digital Competence	0.174	Medium
RPA Adoption → Digital Competence	0.132	Small–Medium
AI Adoption → Accountants' Performance	0.118	Small
RPA Adoption → Accountants' Performance	0.096	Small
Digital Competence → Accountants' Performance	0.156	Medium

Interpretation: Table 6 presents the effect-size results. AI Adoption has a medium effect on Digital Competence (f^2 = 0.174), whereas RPA Adoption has a small effect that approaches the medium threshold (f^2 = 0.132). AI Adoption and RPA Adoption have small effects on Accountants' Performance, with f^2 values of 0.118 and 0.096, respectively. Digital Competence demonstrates a medium effect on Accountants' Performance (f^2 = 0.156).

These interpretations follow commonly used PLS-SEM guidelines, where approximately 0.02, 0.15, and 0.35 represent small, medium, and large effects, respectively (Hair et al., 2022).

3.1.5. Predictive Relevance

Table 7. Predictive Relevance (Q^2)

Endogenous Construct	Q^2	Predictive Relevance
Digital Competence	0.301	Yes
Accountants' Performance	0.387	Yes

Interpretation:Table 7 shows positive Q^2 values for both endogenous constructs. The Q^2 value for Digital Competence is 0.301, while the value for Accountants' Performance is 0.387. Positive Q^2 values indicate predictive relevance under the relevant PLS-SEM predictive-assessment procedure (Hair et al., 2022).

3.1.6. Direct Effects and Hypothesis Testing

Table 8. Direct Effects and Hypotheses Testing

Hypothesis	Relationship	B	t-value	p-value	Decision
H1	AI Adoption → Accountants' Performance	0.310	4.82	<0.001	Supported
H2	RPA Adoption → Accountants' Performance	0.280	4.35	<0.001	Supported
H3	AI Adoption → Digital Competence	0.390	6.21	<0.001	Supported
H4	RPA Adoption → Digital Competence	0.340	5.47	<0.001	Supported
H5	Digital Competence → Accountants' Performance	0.360	5.63	<0.001	Supported

Interpretation: Table 8 presents the direct effects and hypothesis-testing results. Bootstrapping was used to assess the statistical significance of the structural path coefficients, with significance evaluated using the resulting t-values and p-values (Hair et al., 2022).

AI Adoption has a positive and statistically significant effect on Accountants' Performance (β = 0.310, t = 4.82, p < 0.001), supporting H1. RPA Adoption also has a positive and statistically significant effect on Accountants' Performance (β = 0.280, t = 4.35, p < 0.001), supporting H2.

AI Adoption has a positive and statistically significant effect on Digital Competence (β = 0.390, t = 6.21, p < 0.001), supporting H3. Similarly, RPA Adoption has a positive and statistically significant effect on Digital Competence (β = 0.340, t = 5.47, p < 0.001), supporting H4.

Finally, Digital Competence has a positive and statistically significant effect on Accountants' Performance (β = 0.360, t = 5.63, p < 0.001), supporting H5.

3.1.7. Mediation Analysis

Table 9. Mediating Effect of Digital Competence

Hypothesis	Indirect Relationship	β	t-value	p-value	Decision
H6	AI Adoption → Digital Competence → Accountants' Performance	0.140	3.91	<0.001	Supported
H7	RPA Adoption → Digital Competence → Accountants' Performance	0.122	3.52	<0.001	Supported

Interpretation: Table 9 presents the indirect effects of AI Adoption and RPA Adoption on Accountants' Performance through Digital Competence. The indirect effect of AI Adoption on Accountants' Performance through Digital Competence is positive and statistically significant (β = 0.140, t = 3.91, p < 0.001). Therefore, H6 is supported.

Similarly, the indirect effect of RPA Adoption on Accountants' Performance through Digital Competence is positive and statistically significant (β = 0.122, t = 3.52, p < 0.001), supporting H7.

The results indicate that Digital Competence represents an important mechanism through which AI Adoption and RPA Adoption are associated with improved Accountants' Performance. Because the direct effects of AI Adoption and RPA Adoption on Accountants' Performance are also positive and statistically significant, the pattern is consistent with complementary partial mediation, provided that the corresponding bootstrap confidence intervals and total effects confirm this interpretation (Hair et al., 2022).

For the final version, the mediation table should ideally include the bootstrapped 95% confidence intervals for both indirect effects. The confidence interval should be taken directly from SmartPLS and should not be estimated manually.

In PLS-SEM, mediation is examined by assessing the indirect effect transmitted through the mediator; Smart PLS reports direct, indirect, and total effects for this purpose.

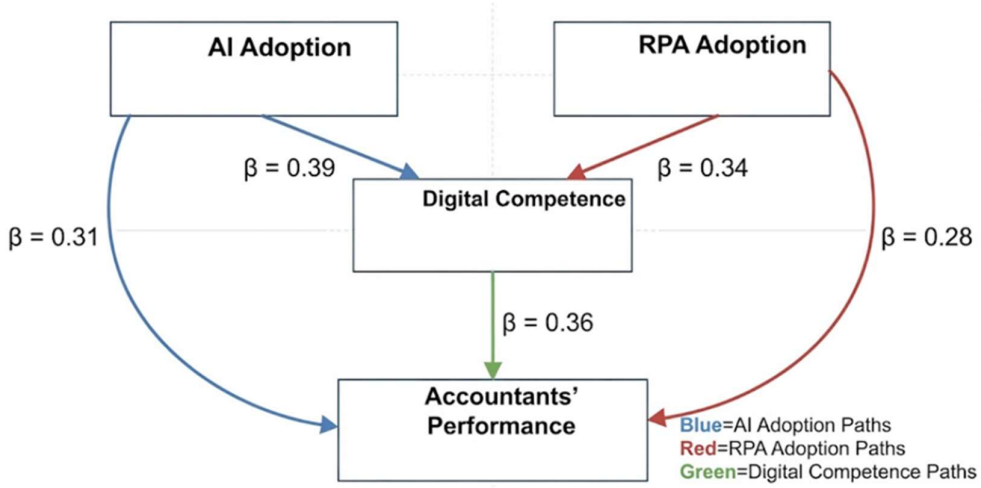


Figure 2. Structural Path Model of Technology Adoption and Performance in Accounting

3.2. Discussion

The results support H1, indicating that AI adoption has a positive and statistically significant effect on accountants' performance (β = 0.310, p < 0.001). This finding suggests that AI can improve accountants' performance by supporting data analysis, identifying anomalies, processing large volumes of information, and assisting professional decision-making. These findings are consistent with recent research showing that AI is increasingly transforming accounting activities and encouraging accountants to perform more analytical and strategic tasks (Castanheira & Loureiro, 2026).

Furthermore, Imjai et al. (2025) found that AI literacy is associated with improved analytical capabilities, critical thinking, and adaptability among prospective accountants. This supports the argument that effective use of AI can enhance the professional capabilities required in increasingly digital accounting environments.

The findings also support H2, demonstrating that RPA adoption has a positive and statistically significant effect on accountants' performance (β = 0.280, p < 0.001). This result indicates that automating repetitive and rule-based accounting activities can improve efficiency and allow accountants to devote more attention to analytical and value-adding activities. This finding is consistent with recent systematic research indicating that RPA is increasingly being implemented in accounting and auditing activities, particularly for repetitive and standardized processes (Kassar & Jizi, 2026).

Evidence from Big Four public accounting firms also suggests that RPA is perceived as increasingly important for transforming work processes, although perceptions of its implementation may vary across organizational levels (Cooper et al., 2020).

H3 was supported, showing that AI adoption has a positive and significant effect on digital competence ($\beta = 0.390$, $p < 0.001$). This suggests that greater exposure to AI technologies may encourage accountants to develop their ability to use digital tools, interpret technology-generated information, and adapt to technology-intensive accounting environments. This finding is consistent with Satjawisate et al. (2025), who emphasized that digital transformation is changing the competencies required by accounting professionals.

H4 was also supported, indicating that RPA adoption positively affects digital competence ($\beta = 0.340$, $p < 0.001$). This finding suggests that accountants who interact with automated systems may develop greater familiarity with digital workflows, automated processes, and technology-supported accounting activities. The finding is consistent with the broader literature emphasizing that technological transformation requires accounting professionals to acquire new digital capabilities and adapt to changing work processes (Satjawisate et al., 2025).

The results support H5, demonstrating a positive and statistically significant relationship between digital competence and accountants' performance ($\beta = 0.360$, $p < 0.001$). This finding indicates that accountants with stronger digital competencies may be better able to use technological tools, analyze digital information, solve technology-related problems, and adapt to changing professional requirements. This result is consistent with Satjawisate et al. (2025), who identified digital competence as an increasingly important requirement for accounting professionals in technology-intensive environments.

H6 was supported because the indirect effect of AI adoption on accountants' performance through digital competence was positive and statistically significant ($\beta = 0.140$, $t = 3.91$, $p < 0.001$). This finding suggests that AI adoption can improve accountants' performance through two mechanisms: the direct benefits of AI and the development of digital competence. This interpretation is consistent with the human–technology perspective emphasized in recent accounting literature, which views technological transformation as increasingly involving collaboration between accounting professionals and digital technologies (Castanheira & Loureiro, 2026).

H7 was also supported because the indirect effect of RPA adoption on accountants' performance through digital competence was positive and statistically significant ($\beta = 0.122$, $t = 3.52$, $p < 0.001$). This finding indicates that the benefits of RPA may extend beyond the direct automation of repetitive activities. RPA adoption may also increase accountants' exposure to automated systems and digital processes, thereby strengthening their digital competence and contributing to improved professional performance (Kassar & Jizi, 2026).

Overall, the findings demonstrate that accountants' performance is influenced by both technological adoption and human digital capabilities. AI adoption and RPA adoption have significant direct effects on accountants' performance, while digital competence provides an additional mechanism through which these technologies contribute to professional outcomes. This supports the argument that digital transformation in accounting should not be viewed solely as a technological process; rather, successful transformation requires the integration of technology with appropriate professional competencies (Satjawisate et al., 2025; Castanheira & Loureiro, 2026).

The findings also extend previous research by integrating AI adoption, RPA adoption, digital competence, and accountants' performance within a single analytical framework. This provides further evidence that technological investments are more likely to generate professional value when accountants possess the digital competencies necessary to effectively use and integrate these technologies into their work (Imjai et al., 2025; Satjawisate et al., 2025).

4. Conclusion

This study examined the effects of Artificial Intelligence (AI) adoption and Robotic Process Automation (RPA) adoption on accountants' performance, with particular attention to the mediating

role of digital competence. The findings indicate that both AI and RPA adoption have positive and statistically significant effects on accountants' performance. In addition, both technologies have significant positive effects on digital competence, while digital competence itself has a significant positive effect on accountants' performance. The mediation results further demonstrate that digital competence plays an important role in explaining how AI and RPA adoption contribute to accountants' performance. The significant indirect effects indicate that technological adoption can generate professional benefits not only through the direct capabilities of digital technologies but also through the development and effective use of accountants' digital competencies. Overall, the findings support the proposed conceptual model and demonstrate the importance of considering both technological and human factors when examining digital transformation in accounting. The study therefore concludes that organizations should not consider AI and RPA implementation as purely technological investments. To maximize the benefits of these technologies, organizations should also invest in developing accountants' digital competence through continuous training, professional development, and practical exposure to emerging digital technologies. The study provides several theoretical implications for the accounting and digital transformation literature. First, it contributes to the growing literature on technology adoption in accounting by examining AI and RPA simultaneously rather than treating them as completely separate technological developments. This integrated perspective reflects the increasingly interconnected nature of digital transformation within accounting environments. Second, the study highlights the importance of human capabilities in explaining the outcomes of technological adoption. While AI and RPA provide technological capabilities, their contribution to accountants' performance is partly dependent on digital competence. This supports the argument that technological transformation should be examined through the interaction between technological resources and human capabilities. Third, the study contributes to the literature by positioning digital competence as a mediating mechanism. Previous research has frequently examined technology adoption, AI literacy, and digital competencies independently. The present study extends this literature by proposing that digital competence may explain part of the relationship between technological adoption and professional performance. The findings have important implications for accounting firms, organizations, professional institutions, and accounting departments. Organizations seeking to implement AI and RPA should provide accountants with appropriate training before and during technology implementation. Training programs should focus not only on operating specific software but also on broader digital competencies, including data analysis, digital problem-solving, AI literacy, technology evaluation, and the interpretation of automated outputs. Accounting firms should also redesign work processes so that automation reduces repetitive activities while accountants are given greater opportunities to perform analytical, advisory, and decision-support functions. Such an approach may allow organizations to obtain greater value from AI and RPA while maintaining the importance of professional judgment and human oversight. Professional accounting institutions may also consider updating professional development programs and competency frameworks to reflect the increasing importance of AI, automation, data analytics, and other digital technologies. Despite its contributions, this study has several limitations. First, the cross-sectional research design limits the ability to establish causal relationships between AI adoption, RPA adoption, digital competence, and accountants' performance. Future research could employ longitudinal designs to examine how these relationships develop over time. Second, the study relies on questionnaire-based measures. Self-reported responses may be affected by respondents' perceptions and may not completely reflect actual technology usage or objective performance. Future studies could combine questionnaire data with objective performance indicators, system-usage data, or supervisor evaluations. Third, the study focuses on four main constructs: AI adoption, RPA adoption, digital competence, and accountants' performance. Other factors, such as organizational support, technological readiness, training, management support, job characteristics, and organizational culture, may also influence the relationships examined in this study. Finally, the generalizability of the findings may depend on the characteristics of the selected population and organizational context. Future studies could examine accountants from different countries, industries, organizational sizes, and professional settings to determine whether the relationships remain consistent across different contexts. Future research could extend the proposed model by incorporating additional organizational and individual factors. For example, organizational support, technology readiness, training quality, management support, and perceived usefulness could be examined as antecedents or moderators. Future studies could also investigate whether accountants' experience, age, education, professional position, or level of technology exposure moderates the relationship between AI and RPA adoption and professional performance. In addition, longitudinal research would provide stronger evidence regarding the

development of digital competence following the implementation of AI and RPA. Future research could also compare organizations with different levels of technological maturity to determine whether the effects of AI and RPA differ according to the stage of digital transformation. Finally, future researchers could examine whether other human capabilities, such as AI literacy, analytical thinking, digital resilience, technological self-efficacy, and professional judgment, mediate or moderate the relationship between emerging technologies and accountants' performance. These directions could provide a more comprehensive understanding of how accounting professionals can successfully adapt to the continuing digital transformation of the profession.

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