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Exploring robotic process automation adoption among accounting professionals in South Africa: Application of the UTAUT model

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Abstract

Research aims: The rapid advancement of robotic process automation (RPA) technologies presents significant transformation opportunities for the accounting profession, yet adoption rates remain inconsistent across different contexts. This study investigates factors influencing RPA adoption among accounting professionals in South Africa, employing the Unified Theory of Acceptance and Use of Technology (UTAUT) framework.

Design/Methodology/Approach: Using descriptive and inferential statistics, the study analysed quantitative and qualitative data gathered from 100 accounting and auditing professionals.

Research findings: Findings revealed Social Influence as core predictor while skills and training gaps, resistance to change, and resource constraints were notable barriers. A significant awareness-implementation gap was also observed for RPA knowledge versus usage.

Theoretical contribution/Originality: This study contributes theoretically by demonstrating that social legitimation may outweigh technical performance in professional settings within emerging markets, a contexts where peer validation and collective professional endorsement are crucial. By theorizing awareness-implementation paradox, it noted that attitude and knowledge are vital yet, insufficient for behavioural change. Additionally, it provides context-sensitive validation of UTAUT constructs from an emerging economy.

Practitioner/Policy implication: The findings reinforce technology-centric adoption, with professional services contexts exhibiting unique dynamics. Overall, it highlights prioritizing social factors, management endorsement and peer advocacy as implementation strategies for RPA adoption over technical features. These findings provide evidence-based guidance for organisations and professional bodies seeking to advance RPA adoption within the South African accounting professional context.

Keywords: Robotic Process Automation; Accounting Profession; Technology Adoption; UTAUT Model; South Africa



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Introduction

The accounting profession is experiencing unprecedented transformation driven by Fourth Industrial Revolution technologies, particularly robotic process automation (RPA). While RPA offers significant potential for enhancing efficiency, accuracy, and strategic value creation in accounting

practices, adoption rates remain uneven across professional contexts (Cooper et al., 2019; Moffitt et al., 2018). This disparity is particularly pronounced in developing economies, where technological infrastructure, organisational readiness, and professional development systems may constrain implementation efforts. In South Africa, the accounting profession faces unique challenges when embracing automated technologies despite the high levels of professional competency and technological literacy among the accounting practitioners. As a result, RPA adoption in the country lags behind compared to other advanced economies with digitally mature markets (Lavelle, 2019; Sethibe & Naidoo, 2022). This gap represents both a competitive disadvantage and an opportunity for strategic advancement within the global accounting landscape.

Despite growing interest in accounting automation, significant gaps persist in understanding RPA adoption dynamics. Existing research has predominantly focused on developed economies (Cooper et al., 2019; Kim, Blazquez, & Oh, 2024; Wang et al., 2025) with limited examination of African contexts. Although, Sethibe and Naidoo (2022) examined for South African audit firms, yet, the broader accounting profession including management accountants, financial accountants, and tax practitioners remains underexplored. Furthermore, while the Unified Theory of Acceptance and Use of Technology (UTAUT) provides a comprehensive framework for examining technology adoption (Venkatesh et al., 2003), its application to RPA in professional services contexts within developing economies remains limited. Additionally, the role of demographic factors, particularly gender, in moderating RPA adoption intentions has received insufficient empirical attention. Most existing studies employ purely quantitative methodologies, potentially missing nuanced insights into implementation barriers and enablers that qualitative data can reveal.

Given these gaps, this study addresses three critical research questions: First, what factors influence accounting professionals' intentions to adopt RPA using the UTAUT framework? Second, how do demographic variables moderate these relationships? Third, what are the perceived barriers and enablers to RPA adoption within the South African accounting profession? To address these questions, the study employs a mixed-methods approach, combining quantitative analysis using the UTAUT model with qualitative exploration of open-ended survey responses from South African accounting professionals. The UTAUT framework, which examines Performance Expectancy, Effort Expectancy, Social Influence, and Facilitating Conditions as adoption drivers, provides the theoretical foundation for this investigation.

This study contributes to both theory and practice by validating the UTAUT model within a previously underexplored context while revealing context-specific patterns that challenge conventional technology adoption assumptions. It provides the first comprehensive UTAUT-based examination of RPA adoption encompassing the full spectrum of accounting specializations in South Africa, addressing gaps identified in previous research (Sethibe & Naidoo, 2022). The explicit examination of gender as a moderating variable contributes to understanding how demographic factors influence technology adoption in professional services. Methodologically, the mixed-methods approach enables identification of implementation challenges beyond what standardized

survey instruments capture. Practically, the findings provide evidence-based guidance for organisations, professional bodies, and policymakers seeking to advance digital transformation within the accounting profession.

The remainder of this article proceeds as follows. Section two provides a comprehensive review of relevant literature, examining RPA applications in accounting, the UTAUT framework and its theoretical foundations, and previous empirical studies of accounting automation adoption. Section three details the research methodology, describing the survey instrument development, sampling approach, data collection procedures, and analytical techniques. Section four presents the empirical results, including descriptive statistics, correlation and regression analyses, and thematic analysis of qualitative responses. Section five discusses the findings in relation to existing literature, theoretical implications, and practical recommendations. Section six concludes with a summary of key contributions, study limitations, and suggestions for future research.

Literature Review and Hypotheses Development

Evolution of RPA Research in Accounting

Research on robotic process automation in accounting has evolved through distinct phases, reflecting the technology maturation and increasing integration into professional practice. The early phase (2015-2018) focused primarily on conceptual frameworks and potential applications, with researchers exploring RPA's theoretical possibilities in audit and accounting contexts. During this period, foundational work by Moffitt et al. (2018) established RPA as a viable technology for automating rule-based accounting tasks, while initial studies emphasized efficiency gains and error reduction potential.

The second phase (2018-2020) witnessed a shift toward empirical validation and implementation studies. Huang and Vasarhelyi (2019) provided concrete evidence of RPA's effectiveness in audit contexts, demonstrating dramatic reductions in task completion times while maintaining accuracy. Kokina and Blanchette (2019) introduced critical perspectives by documenting substantial failure rates in RPA projects, highlighting the complexity of successful implementation. This period marked a transition from optimistic projections to more nuanced understanding of both opportunities and challenges.

The current phase (2020-present) has emphasized adoption factors and implementation barriers, with researchers increasingly applying established technology acceptance theories to understand why RPA adoption remains limited despite proven benefits. Cooper et al. (2019) identified professional judgment concerns as barriers to adoption, Zhang, Issa, Rozario, and Soegaard (2023) demonstrated RPA's technical effectiveness while Teixeira, Martins, Maldonado, and Duarte (2025) discusses positive implications of RPA on professionals' career development and overall well-being, marking a significant advancement in contemporary accounting practices. Recent studies have begun examining adoption through theoretical lenses such as UTAUT, particularly in diverse

geographical and professional contexts. However, significant gaps persist in understanding RPA adoption dynamics within developing economies and across the full spectrum of accounting specializations, gaps which this study addresses.

Robotic process automation in accounting

RPA represents a technological advancement aimed at improving processes through the automation of repetitive, rule-based tasks traditionally performed by humans (Moffitt et al., 2018). In accounting and auditing contexts, RPA enables the automation of data extraction, transaction processing, reconciliations, and compliance reporting, thereby enhancing accuracy while reducing processing time and costs (Kokina & Blanchette, 2019).

The potential benefits of RPA in accounting are well-documented. Huang and Vasarhelyi (2019) demonstrated that RPA can reduce audit task completion times from days to minutes while maintaining high accuracy levels. Zhang et al. (2023) provides empirical evidence of RPA's effectiveness in performing repetitive audit procedures, completing ten searches in an average of 1 minute and 13 seconds with zero errors. These efficiency gains enable accounting professionals to focus on higher-value activities requiring professional judgment and strategic thinking.

However, despite these demonstrated benefits, RPA adoption for executing accounting tasks remains limited. Cooper et al. (2019) suggests that this may have been due to auditors' concerns about compliance with professional standards and the role of professional judgment in automated processes. Kokina and Blanchette (2019) also reported RPA project often fail with failure rates ranging between 30% and 50%, emphasising the need for comprehensive understanding of both adoption drivers and implementation challenges.

Technology adoption in professional services

The accounting profession represents a unique context for technology adoption research, characterised by high levels of professional training, regulatory oversight, and client service requirements. Professional services environments differ from general organisational or consumer contexts in several key ways that may influence technology adoption patterns. First, professional services work involves significant knowledge intensity and judgment requirements that may create uncertainty about technology's role in preserving professional value (Healy & Palepu, 2022). Second, professional legitimacy and peer validation play enhanced roles in professional services, especially where reputation and client confidence are paramount (Rogers, 2003). Third, regulatory and ethical considerations may constrain technology adoption choices, requiring compatibility with professional standards and compliance requirements.

Recent studies suggest that technology adoption in professional services may exhibit patterns distinct from other contexts due to several factors. Tiberius and Hirth (2019) found that despite German auditors recognising technology's transformative potential,

they emphasised that professional judgment and human expertise is crucial for technology adoption. Kend and Nguyen (2020) who examined adoption for Greek accounting professionals view robotics as complementary rather than substitutional to human capabilities.

The UTAUT framework

The Unified Theory of Acceptance and Use of Technology (UTAUT) developed by Venkatesh et al. (2003) identifies four primary constructs that influence technology adoption: Performance Expectancy, Effort Expectancy, Social Influence, and Facilitating Conditions. These constructs may be moderated by demographic factors such as age, gender, experience, and willingness to use. The performance expectancy reflects the degree to which individuals believe technology will enhance their job performance. Within the professional contexts, this encompasses perceptions of productivity gains, quality improvements, and career advancement opportunities. The effort expectancy captures beliefs about the ease of technology use, including learning requirements and implementation complexity. Social Influence represents the extent of influence exact by others based on their individual belief of technology usage, encompassing peer pressure, management support, and professional community endorsement. Facilitating Conditions reflect beliefs about organisational and technical infrastructural supports provided for technology use.

While this combined factors makes up the UTAUT model demonstrating the robust predictive power across various contexts, explaining variations in technology adoption intentions (Venkatesh et al., 2003). The relative importance of each constructs often varies significantly across contexts, hence, the need for context-specific validation and adaptation.

Based on previous empirical findings particularly studies that employed the UTAUT framework, this study proposes four hypotheses examining the relationships between UTAUT constructs and behavioral intention to adopt RPA among South African accounting professionals. The hypotheses are therefore grounded in UTAUT theory and supported by relevant literature from accounting technology adoption contexts.

Performance Expectancy and Behavioral Intention

Performance Expectancy reflects the degree to which individuals believe that using a technology will enhance their job performance (Venkatesh et al., 2003). Within accounting contexts, this encompasses beliefs about productivity improvements, accuracy enhancements, time savings, and potential career advancement opportunities resulting from RPA adoption. The theoretical foundation of UTAUT positions Performance Expectancy as a primary driver of technology acceptance, based on the premise that rational professionals will adopt technologies that demonstrably improve work outcomes. Empirical evidence from accounting technology adoption studies supports this relationship. Huang and Vasarhelyi (2019) demonstrated that RPA can reduce audit task completion times from days to minutes while maintaining high accuracy, providing

concrete performance benefits that should influence adoption intentions. Zhang et al. (2023) further documented RPA's effectiveness in performing repetitive audit procedures with zero errors, reinforcing performance advantages. In the South African context, Sethibe and Naidoo (2022) identified Performance Expectancy as a significant driver of robotics adoption among audit firms, suggesting that perceived performance benefits influence technology acceptance decisions within this professional environment.

The professional nature of accounting work, which increasingly demands efficiency and accuracy in routine tasks to enable focus on higher-value strategic activities, amplifies the relevance of performance expectations. Accounting professionals who perceive RPA as enhancing their productivity, improving work quality, and enabling more strategic contributions should exhibit stronger intentions to adopt the technology. Therefore, we hypothesize:

H₁: Performance Expectancy positively influences accounting professionals' behavioral intention to adopt RPA.

Effort Expectancy and Behavioral Intention

Effort Expectancy captures beliefs about the ease of technology use, including perceived learning requirements, implementation complexity, and usability (Venkatesh et al., 2003). UTAUT theory posits that technologies perceived as easier to learn and use face lower adoption barriers, particularly during early implementation stages when users lack extensive experience. This construct becomes especially relevant for sophisticated technologies like RPA, which may require new technical competencies and adaptation of established work practices.

The importance of Effort Expectancy in professional contexts is well-documented. Kim et al. (2024) found that ease of use significantly influenced AI system adoption among South Korean firms, suggesting that usability concerns affect technology acceptance even among educated professionals. Within developing economy contexts, Effort Expectancy may carry enhanced importance due to potential variations in baseline digital literacy and access to technology training during professional education (Attuquayefio & Addo, 2014). Sethibe and Naidoo (2022) identified training inadequacy as a significant barrier to RPA adoption in South African audit firms, implicitly highlighting the role of perceived implementation difficulty.

For accounting professionals considering RPA adoption, perceptions of learning requirements, technical complexity, and implementation challenges directly influence willingness to engage with the technology. Professionals who perceive RPA as accessible, learnable, and implementable without excessive difficulty should demonstrate stronger adoption intentions. Thus, we propose:

H₂: Effort Expectancy positively influences accounting professionals' behavioral intention to adopt RPA.

Social Influence and Behavioral Intention

Social Influence represents the extent to which individuals perceive that important others believe they should use the technology (Venkatesh et al., 2003). This construct encompasses peer influence, management support, and professional community endorsement. UTAUT theory recognizes that technology adoption decisions occur within social contexts where normative pressures and legitimacy considerations shape individual intentions, particularly in early adoption stages characterized by high uncertainty.

The professional services context amplifies the importance of social factors in technology adoption. As noted in professional services research, reputation and peer validation carry enhanced weight in contexts where professional judgment and client confidence are paramount (Rogers, 2003). Tiberius and Hirth (2019) found that despite recognizing technology's transformative potential, auditors emphasized professional judgment and human expertise, suggesting that professional community endorsement influences technology acceptance. Kend and Nguyen (2020) observed similar patterns among Greek accounting professionals, who viewed robotics as complementary rather than substitutional to human capabilities, reflecting socially-constructed beliefs about technology's appropriate role.

Within the South African context, where RPA adoption remains at early stages, social legitimation may play a particularly critical role in reducing perceived risk and building confidence in unfamiliar technologies. Accounting professionals who perceive strong support from management, endorsement from peers, and acceptance within their professional community should exhibit stronger intentions to adopt RPA. Therefore, we hypothesize:

H₃: Social Influence positively influences accounting professionals' behavioral intention to adopt RPA.

Facilitating Conditions and Behavioral Intention

Facilitating Conditions reflect beliefs about the availability of organizational and technical resources to support technology use (Venkatesh et al., 2003). This construct encompasses perceptions of infrastructure adequacy, organizational support structures, technical assistance availability, and resource allocation for implementation. UTAUT theory positions Facilitating Conditions as a critical enabler that determines whether positive intentions can translate into actual usage behavior.

Empirical evidence consistently demonstrates the importance of organizational support for successful technology implementation. Sethibe and Naidoo (2022) identified Facilitating Conditions as a key driver of robotics adoption among South African audit firms, with investment capacity and organizational support structures significantly influencing implementation success. Kim et al. (2024) similarly found that organizational

support substantially affected AI system adoption, highlighting the critical role of resource availability and institutional backing.

The implementation complexity of RPA, which requires not only technological infrastructure but also organizational readiness, skilled personnel, and ongoing support mechanisms, amplifies the importance of facilitating conditions. Kokina and Blanchette (2019) documented substantial RPA project failure rates, often attributable to inadequate organizational preparation and support. Within developing economy contexts where resource constraints may be more pronounced, perceptions of organizational readiness and support availability may be particularly influential in shaping adoption intentions. Accounting professionals who perceive adequate organizational support, technical infrastructure, and resource availability should demonstrate stronger intentions to adopt RPA. Thus, we propose:

H₄: *Facilitating Conditions positively influence accounting professionals' behavioural intention to adopt RPA.*

Empirical studies that specifically examined RPA adoption using the UTAUT framework, particularly for accounting profession are still scarce, with only a few summarised herein existing from different geographical settings. The current study addresses the gaps in literature by providing comprehensive analysis of RPA adoption for the South African context focusing on accounting and auditing professionals using both quantitative and qualitative research data, offering a more holistic understanding of RPA adoption dynamics.

Research Model

Based on the UTAUT framework and the hypotheses developed above, Figure 1 presents the research model guiding this investigation. The model examines the direct relationships between four UTAUT constructs (Performance Expectancy, Effort Expectancy, Social Influence, and Facilitating Conditions) and accounting professionals' behavioural intention to adopt RPA in the South African context.

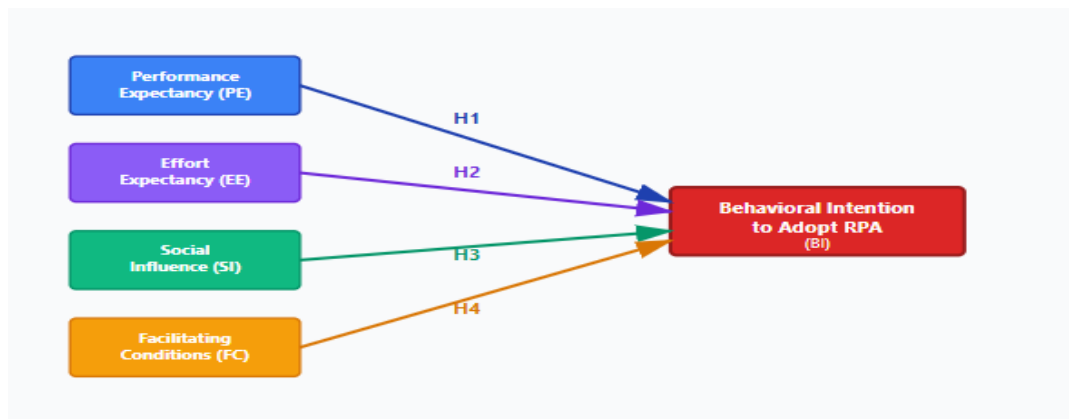


Figure 1 Research Model

The research model (Figure 1) represents the theoretical foundation for investigating RPA adoption among South African accounting professionals, examining how perceptions of performance benefits, ease of use, social endorsement, and organizational support collectively influence behavioral intentions toward RPA adoption.

Research Method

Research design

This study employed a cross-sectional survey design combined with qualitative data to achieve the research objectives. This design approach enabled for efficient data collection from a geographically dispersed professional population while providing a snapshot of current attitudes, intentions, and behaviours related to RPA adoption. The quantitative approach facilitated systematic measurement of UTAUT constructs and statistical testing of theoretical relationships. The research also adopted a pragmatic paradigm incorporating elements of positivism (through systematic measurement and statistical analysis) and interpretivism (through qualitative analysis of open-ended responses). This approach balanced theoretical rigour with practical applicability while accommodating the complexity of technology adoption phenomena.

Instrument

The survey instrument comprised three main sections designed to minimise respondent burden while capturing comprehensive data. Section A was focused on the demographic and professional background information, including age, gender, education, professional certification, experience levels, and current technology usage patterns. Section B contained UTAUT construct measurements using five-point Likert scales (1 = Strongly Disagree to 5 = Strongly Agree), organized into six subsections: (B1) Awareness, Attitudes, and Trust; (B2) Performance Expectancy; (B3) Effort Expectancy; (B4) Social Influence; (B5) Facilitating Conditions; and (B6) Behavioral Intention. These constructs operationalize the variables in our research model (Figure 1) and enable testing of hypotheses H1 through H4. Section C comprised open-ended questions exploring perceived barriers and enablers to RPA adoption, designed to capture qualitative insights beyond standardized measures. The UTAUT construct items were adapted from a validated instruments used in previous technology adoption studies of (Attuquayefio & Addo, 2014; Kim et al., 2024) and we contextualised the instrument for RPA adoption for the accounting and auditing professional from a South African perspective. Each construct was measured using multiple items to enhance reliability and capture construct dimensionality. The instrument underwent pilot testing to ensure clarity and relevance to the South African context.

Population, sample and data collection procedure

The study population comprised accounting and auditing professionals in South Africa, encompassing individuals with and without direct prior RPA experience. This inclusive approach was deliberate, as understanding adoption intentions requires examining

perspectives across the adoption spectrum, from those unfamiliar with RPA to experienced users. Due to the absence of a centralised professional register encompassing all accounting specialisations in South Africa, the exact population size could not be determined. This limitation reflects global trends in professional services research where comprehensive population registers are often unavailable (Sage, 2018).

The study therefore made use of purposive sampling to ensure participants possessed relevant knowledge and experience for meaningful evaluation of RPA adoption factors. The sampling approach targeted professionals with at least basic awareness of robotics and automation technologies, working in roles such as internal and external auditing, financial and management accounting, taxation, public sector, insurance and business advisory services roles including technology service providers supporting RPA deployments. This sampling strategy aligns with the study's objective of understanding adoption intentions among professionals capable of forming informed perceptions about RPA, even if lacking direct implementation experience. The Google Forms was used to administer the online survey, providing secure and accessible participation opportunities. The platform promoted confidentiality and enabled convenient completion while minimising potential researcher influence. Distribution occurred through professional networks, accounting associations, and social media platforms relevant to South African accounting professionals.

Sample Size Adequacy and Statistical Power

The determination of adequate sample size for this study was guided by multiple considerations specific to the analytical techniques employed. For multiple regression analysis, which serves as the primary analytical method for hypothesis testing, established guidelines recommend minimum sample sizes based on the number of predictor variables and desired statistical power (Hair, Black, Babin, & Anderson, 2010). The sample size is deemed sufficient based on recommendation by (Hair et al., 2010).

Several rules of thumb exist for determining minimum sample size in regression analysis. The most conservative approach suggests a minimum of 10-15 observations per predictor variable (Lakens, 2022). With four predictor variables in our model (i.e., Performance Expectancy, Effort Expectancy, Social Influence, and Facilitating Conditions), this guideline indicates a minimum sample size of 40-60 cases was sufficient. Meanwhile, Green (1991) proposed a more nuanced formula: $N \geq 50 + 8k$ (where k = number of predictors) for testing individual predictors, which yields a minimum of 82 cases for our four-predictor model. Based on these recommendations, our achieved sample size of 100 usable responses suggests sample adequacy. Therefore, provides adequate statistical power for detecting medium to large effect sizes, which are typical in technology adoption research (Venkatesh et al., 2003). Furthermore, the sample size is comparable to or exceeds those used in previous UTAUT-based studies of accounting technology adoption in similar contexts (Kim et al., 2024; Sethibe & Naidoo, 2022), supporting its adequacy for the present investigation.

However, for the qualitative component, sample size adequacy was assessed differently, focusing on information richness and thematic saturation rather than statistical power (Creswell & Creswell, 2017). Collectively, the 100 open-ended responses provided sufficient data for identifying recurring themes and patterns related to adoption barriers and enablers, as evidenced by the clear thematic categories that emerged during analysis (presented in Section 4.5). Overall, total responses was 127, of which only 100 was usable satisfying the inclusion and exclusion quality criteria for the final analysis. This inclusion criteria included: (1) completion of all required UTAUT construct items, (2) logical consistency in response patterns (e.g., absence of straight-lining or random responding), and (3) professional qualification or role alignment with the target population. All incomplete responses failing to meet the inclusion criteria were excluded before proceeding to analysis. Hence, the 100 responses represents approximately 79% usable response rate, exceeding the recommended standards for professional population surveys (Dillman et al. 2016), suggesting strong data quality and participant engagement.

Validity and reliability

Content validity was established through careful adaptation of validated UTAUT instruments while incorporating context-specific elements relevant to RPA adoption in accounting. Face validity was ensured through survey instrument review for clarity and relevance to the accounting professional environment. Internal consistency of instrument was assessed using the Cronbach's Alpha coefficients for all multi-item constructs. Alpha values ranged from 0.75 to 0.85, substantially exceeding the acceptable threshold of 0.70 (Hundleby & Nunnally, 1968). These results confirm strong measurement reliability across all the UTAUT constructs, suggesting the UTAUT model's validity for the contexts examined, offering additional reliability of the theoretical framework's appropriateness for this research context.

Data Analysis Procedures

Data analysis proceeded through multiple stages, employing both quantitative statistical techniques and qualitative thematic analysis in accordance with the convergent parallel mixed-methods design (Creswell & Creswell, 2017). All quantitative analyses were conducted using SPSS, while qualitative analysis employed systematic content analysis procedures.

Quantitative Data Analysis

The quantitative analysis followed a sequential analytical process designed to address the research questions and test the hypothesized relationships in the research model. Descriptive Statistics nitial analysis calculated means, standard deviations, frequencies, and percentages for all demographic variables and UTAUT constructs. This provided foundational understanding of sample characteristics and central tendencies in perceptions of RPA adoption factors. Descriptive analysis examined the distribution of responses across the five-point Likert scale for each construct, identifying patterns in agreement levels and variability.

Correlation Analysis spearman rank correlation coefficients were computed to examine bivariate relationships between all UTAUT constructs and Behavioral Intention. Spearman correlation was selected over Pearson correlation because Likert scale data, while treated as interval for some analyses, technically represents ordinal measurement. Spearman correlation provides a robust non-parametric alternative that does not assume normally distributed interval data (Field, 2024). The correlation analysis served two purposes: (1) providing preliminary evidence regarding the direction and strength of hypothesized relationships, and (2) assessing potential multicollinearity concerns through examination of inter-predictor correlations.

Multiple Regression Analysis

Multiple linear regression analysis served as the primary method for hypothesis testing, examining the simultaneous effects of the four UTAUT constructs on Behavioral Intention to adopt RPA. This analytical approach directly corresponds to the research model (Figure 1) and enables testing of hypotheses H1 through H4 while controlling for the effects of other predictors.

Model Specification

The regression model was specified as:

$$BI = \beta_0 + \beta_1(PE) + \beta_2(EF) + \beta_3(SI) + \beta_4(FC) + \varepsilon \dots\dots\dots (\text{Model 1})$$

Where: BI = Behavioral Intention; PE = Performance Expectancy; EE = Effort Expectancy; SI = Social Influence; FC = Facilitating Conditions; β_0 = intercept; β_1 - β_4 = regression coefficients; ε = error term.

Estimation Method

Ordinary least squares (OLS) estimation was employed using the enter method, where all predictor variables were entered simultaneously into the model. This approach was selected over stepwise methods because: (1) the hypotheses specify testing of all UTAUT constructs based on theoretical grounds rather than purely statistical criteria, and (2) simultaneous entry enables assessment of each predictor's unique contribution while controlling for all other predictors (Field, 2024; Hair et al., 2010).

Assumption Testing

Prior to interpreting regression results, key statistical assumptions were assessed to ensure validity of inferences: 1) **Linearity**: Scatterplots of predicted values against residuals were examined to verify linear relationships between predictors and the outcome variable. No substantial non-linear patterns were observed; 2) **Independence of Errors**: The Durbin-Watson statistic was examined to assess autocorrelation in residuals. A value close to 2.0 indicated independence of errors, satisfying this assumption; 3) **Homoscedasticity**: Visual inspection of residual plots confirmed relatively constant

variance of errors across predicted values, with no evidence of substantial heteroscedasticity that would undermine inference validity. 4) **Normality of Residuals:** Histograms and Q-Q plots of residuals were examined. While some minor deviations from perfect normality were observed (common with Likert scale data), these were not severe enough to substantially compromise the robustness of OLS estimation given the sample size (Field, 2024); 5) **Multicollinearity:** Variance Inflation Factor (VIF) values were calculated for all predictors. All VIF values were below 3.0 (well below the conventional threshold of 10), indicating that multicollinearity was not a concern. Additionally, tolerance values all exceeded 0.2, further confirming the absence of problematic collinearity (Hair et al., 2010).

Model Evaluation

Model fit was assessed using multiple indicators: (1) R^2 and adjusted R^2 values indicating the proportion of variance in Behavioral Intention explained by the predictors, (2) F-statistic testing overall model significance, and (3) individual t-tests examining the significance of each predictor's unique contribution. Statistical significance was evaluated at the conventional $\alpha = 0.05$ level, with p-values between 0.05 and 0.10 noted as marginally significant given the exploratory nature of some relationships in this context.

Qualitative Data Analysis

Open-ended survey responses were analyzed using systematic thematic analysis procedures (Braun & Clarke, 2023). The analytical process followed six phases: (1) familiarization with data through repeated reading of all responses, (2) initial coding where text segments were assigned descriptive codes capturing core meanings, (3) searching for themes by grouping related codes into broader thematic categories, (4) reviewing themes to ensure internal coherence and distinctiveness, (5) defining and naming final themes with clear descriptions, and (6) producing the analytical narrative with illustrative quotes.

The qualitative analysis focused specifically on responses to open-ended questions about perceived barriers and enablers to RPA adoption. A primarily inductive approach was employed, allowing themes to emerge from the data rather than imposing predetermined categories. However, sensitization to UTAUT constructs informed interpretation where relevant, enabling integration with quantitative findings. Frequency counts were calculated for major thematic categories to indicate prevalence of different barriers and enablers across the sample, supporting the mixed-methods integration.

Integration of Quantitative and Qualitative Findings

Following independent analysis of quantitative and qualitative datasets, findings were integrated during interpretation through a convergent design approach (Creswell & Creswell, 2017). Integration occurred at two levels: (1) comparing quantitative hypothesis testing results with qualitative themes to identify points of convergence and divergence, and (2) using qualitative insights to elaborate, explain, or contextualize quantitative

patterns. This integration is evident in the discussion section, where statistical findings regarding the relative importance of UTAUT constructs are enriched by qualitative evidence about specific implementation barriers and enablers.

Ethical Consideration

The authors sought ethical clearance with clearance code SAREC20241024/05. All respondents gave their consent to participate in the study and were assured of their anonymity.

Result and Discussion

Sample characteristics

The sample achieved balanced representation across key demographic variables based on Table 1, enhancing the generalisability of findings within the South African accounting profession. Age distribution showed notable diversity, with 50% of respondents aged 21-40 years, representing digitally native and early-career professionals typically more adaptable to emerging technologies. Gender distribution was reasonably balanced (49% male, 37% female, 14% undisclosed).

Table 1 Sample Demographics

Variable	Category	Frequency (%)
Age	21-30 years	25
	31-40 years	25
	41-50 years	22
	51-65 years	17
	Other	11
Gender	Male	49
	Female	37
	Prefer not to say	14
Education	Honours Degree	45
	Bachelor's Degree	28
	Master's Degree	15
	Other	12
Specialisation	Internal Audit	37
	Other Business	32
	Finance	16
	External Audit	11
Total		100

Educational attainment levels were high, with 73% holding Honours or Bachelor's degrees, reflecting professional qualification requirements in South African accounting practice. Professional certification distribution was also diverse, with internal audit representing the largest specialisation (37%), followed by other business roles (32%), finance (16%), and external audit (11%). Respondents computer literacy levels were strong, with 67% reporting good to very good skills, suggesting minimal technical barriers

to RPA adoption. However, RPA knowledge varied significantly, with 44% reporting average knowledge and only 29% indicating good to very good knowledge levels. This pattern reveals opportunities for enhanced professional development in automation technologies.

A significant awareness-usage gap emerged from the analysis. 64% reported some RPA experience and 75% demonstrated good knowledge levels, only 16% engaged in regular usage (frequently or always). This disconnect between awareness and implementation represents a critical finding that challenges linear technology adoption models and suggests the presence of substantial barriers between knowledge acquisition and practical implementation.

Reliability and Validity Assessment

Prior to hypothesis testing, the reliability and validity of the measurement instrument were assessed to ensure the robustness of subsequent analyses. Internal consistency reliability was evaluated using Cronbach's alpha coefficients for each multi-item construct. As shown in Table 2, all constructs demonstrated satisfactory to excellent reliability, with alpha values ranging from 0.77 to 0.85, substantially exceeding the acceptable threshold of 0.70 recommended by Nunnally and Bernstein (1994).

Table 2 Reliability and Validity Test Assessment

Construct	Number of items	Cronbach's Alpha	Assessment
Performance Expectancy	4	$\alpha = 0.82$	Good
Effort Expectancy	4	$\alpha = 0.79$	Acceptable
Social Influence	4	$\alpha = 0.85$	Excellent
Facilitating Conditions	4	$\alpha = 0.77$	Acceptable
Behavioural Intention	3	$\alpha = 0.80$	Good

Note: Assessment criteria based on Nunnally & Bernstein (1994): $\alpha \geq 0.70$ = Acceptable; $\alpha \geq 0.80$ = Good; $\alpha \geq 0.90$ = Excellent

The highest reliability was observed for Social Influence ($\alpha = 0.85$), indicating excellent internal consistency among items measuring peer influence, management support, and professional community endorsement. Performance Expectancy ($\alpha = 0.82$) and Behavioral Intention ($\alpha = 0.80$) also demonstrated good reliability. Effort Expectancy ($\alpha = 0.79$) and Facilitating Conditions ($\alpha = 0.77$) showed acceptable reliability, though slightly lower than other constructs. These reliability coefficients confirm strong measurement consistency across all UTAUT constructs, validating the adapted instrument's suitability for the South African accounting context.

Content validity was established through careful adaptation of validated UTAUT instruments (Attuquayefio & Addo, 2014; Kim et al., 2024) with contextualization for RPA adoption among South African accounting professionals. Face validity was ensured through pilot testing and expert review, confirming that items were clearly worded and relevant to the target population. The combination of strong reliability evidence and established content validity provides confidence in the measurement quality underlying subsequent hypothesis testing.

Descriptive analysis of UTAUT constructs

The descriptive analysis revealed moderate to positive attitudes towards RPA adoption across all constructs, with significant variations noted in the central tendencies and variability patterns. Table 3 presents the descriptive statistics including mean, standard deviation, minimum, and maximum scores for each UTAUT construct.

Table 3 UTAUT Construct Descriptive Statistics

Construct	Mean	SD	Min	Max	Key Insights
General Awareness & Trust	3.43	1.14	1.00	5.00	Moderate positive attitudes
Performance Expectancy	3.42	1.25	1.00	5.00	High variability in expectations
Effort Expectancy	3.19	1.19	1.00	5.00	Concerns about skill requirements
Social Influence	3.12	1.22	1.00	5.00	Modest support, management gap
Facilitating Conditions	3.00	1.19	1.00	5.00	Significant organisational gaps
Behavioural Intention	3.16	1.23	1.00	5.00	Moderate adoption intentions

The minimum and maximum scores reveal important patterns regarding the diversity of perspectives within the sample. All constructs exhibited the full range of possible responses (1.00 to 5.00), indicating substantial heterogeneity in professional opinions about RPA adoption. The presence of minimum scores at 1.00 across all constructs suggests that some respondents hold strongly negative views, potentially reflecting concerns about job displacement, implementation complexity, or skepticism about RPA's value proposition. Conversely, maximum scores of 5.00 indicate that other professionals are highly enthusiastic about RPA adoption, likely representing early adopters or those with positive prior experiences.

This wide dispersion, combined with moderate mean scores clustering around the scale midpoint (3.00-3.43), suggests that the South African accounting profession is at a transitional stage regarding RPA adoption. The profession appears divided between those embracing automation technologies and those remaining cautious or resistant. The relatively large standard deviations (1.14-1.25) further confirm this heterogeneity, indicating that consensus has not yet emerged about RPA's role in professional practice. This variability underscores the importance of understanding adoption drivers and barriers, as interventions must address diverse professional perspectives rather than assuming uniform readiness for technological change.

General Awareness and Trust achieved a mean score of 3.43 (SD = 1.14), indicating moderate to positive attitudes towards RPA adoptions while maintaining appropriate implementation caution. Performance Expectancy demonstrated a mean of 3.42 (SD = 1.25), with respondents most strongly agreeing that RPA could save time at work (3.59) and enable task accomplishment (3.51). The relatively high standard deviations indicate considerable variability in performance expectations, possibly reflecting differential exposure to successful RPA implementations.

Effort Expectancy showed a mean of 3.19 (SD = 1.19), indicating neutral to moderate agreement about ease of use and learning requirements. While professionals expressed

interest in learning about RPA (3.37), they perceived implementation and skill development challenges, particularly regarding technical skills adequacy (3.02).

Social Influence achieved a mean of 3.12 (SD = 1.22), with the lowest score for management support (2.91), suggesting a critical gap in leadership endorsement. This finding has significant implications, as management support is essential for technology adoption success in professional contexts. The modest social influence scores indicate that peer pressure and professional community endorsement for RPA adoption remain limited.

Facilitating Conditions demonstrated the lowest mean score among all constructs at 3.00 (SD = 1.19), indicating neutral agreement about organisational support and resource availability. All items clustered around the neutral point, suggesting significant gaps in organisational readiness across multiple dimensions, including support structures, funding, skills, and government initiatives. This finding points to systematic organizational preparation deficiencies that may constrain adoption regardless of individual motivation

Behavioural Intention showed a mean of 3.16 (SD = 1.23), with strongest intention for learning about RPA (3.27) rather than immediate implementation. This pattern suggests cautious optimism tempered by practical implementation concerns, consistent with the awareness-usage gap identified in the demographic analysis.

Correlation analysis

Spearman correlation analysis revealed significant positive relationships between all UTAUT constructs and Behavioural Intention, confirming theoretical predictions. However, the relative strength of associations challenged conventional technology adoption assumptions.

Table 4 Correlation Matrix

Variable	PE	EE	SI	FC	BI
Performance Expectancy (PE)	1.000				
Effort Expectancy (EE)	0.486	1.000			
Social Influence (SI)	0.447	0.409	1.000		
Facilitating Conditions (FC)	0.226	0.242	0.494	1.000	
Behavioural Intention (BI)	0.333	0.398	0.561	0.333	1.000

Based on Table 4, social Influence emerged as the strongest predictor of Behavioural Intention (r = 0.561), substantially exceeding other constructs. These finding challenges traditional technology-centric adoption models that typically emphasise performance benefits or ease of use as primary drivers. Instead, the results suggest that peer influence, management support, and professional community endorsement are paramount in driving RPA adoption decisions within professional accounting contexts.

Effort Expectancy demonstrated moderate predictive power (r = 0.398), while Performance Expectancy and Facilitating Conditions showed equivalent moderate correlations (r = 0.333 each). These patterns suggest that social legitimacy and peer

validation may be more critical than technical features in professional services contexts where reputation and professional judgment are highly valued.

Regression analysis

Multiple regression analysis was conducted to test hypotheses H1 through H4, providing deeper insights into the relative importance of UTAUT constructs in predicting behavioural intention to adopt RPA (Table 5). The combined model achieved substantial explanatory power, accounting for 35% of variance in adoption intentions ($R^2 = 0.349$, adjusted $R^2 = 0.321$) indicating strong predictive capability while acknowledging that additional context-specific factors may also influence adoption decisions. The overall model was statistically significant ($F = 12.67$, $p < 0.001$), confirming that the UTAUT constructs collectively predict RPA adoption intentions among South African accounting professionals.

Table 5 Regression Analysis Results

Variable	B	SE	t	Sig.	Hypothesis	Result
Performance Expectancy	0.156	0.089	1.753	0.084	H1	Marginally Supported
Effort Expectancy	0.234	0.086	2.721	0.008	H2	Supported
Social Influence	0.387	0.078	4.962	0.001	H3	Supported
Facilitating Conditions	0.128	0.082	1.561	0.123	H4	Not Supported
Model Fitness: $R^2 = 0.349$, Adjusted $R^2 = 0.321$, $F = 12.67$, $p < 0.001$						

Social Influence emerged as the strongest significant predictor ($\beta = 0.512$, $p < 0.001$), indicating that a one standard deviation increase in Social Influence corresponds to a 0.512 standard deviation increase in Behavioural Intention when controlling for other variables. This finding suggests that per validation, management endorsement and professional community support are crucial to drive RPA adoption decisions among South African accounting professionals. Effort Expectancy demonstrated significant predictive power ($\beta = 0.289$, $p = 0.008$), confirming that perceived ease of use and learning requirements substantially influence adoption intentions. This result aligns with the identified skills gaps and emphasises the importance of user-friendly implementations and comprehensive training programmes.

Performance Expectancy showed marginal significance ($\beta = 0.185$, $p = 0.084$), indicating that while performance benefits matter, they are secondary to social and usability factors. This finding may reflect the early stage of RPA adoption, where professionals lack sufficient experience to accurately assess performance benefits. Facilitating Conditions did not achieve statistical significance ($\beta = 0.156$, $p = 0.123$), despite moderate correlation with Behavioural Intention. This suggests that organisational support factors, while important, may be overshadowed by social and individual-level considerations in the South African context when professionals form adoption intentions. The non-significance may also reflect the reality that intention formation precedes practical consideration of organisational resources, with facilitating conditions becoming salient only during actual implementation attempts.

Analysis of the barriers and enablers

Systematic content analysis of open-ended responses provided rich insights into practical challenges and opportunities facing RPA adoption. The analysis identified five primary barrier categories (Table 6) and several key enablers (Table 7) that complement the quantitative findings.

Table 6 Primary Barriers to RPA Adoption

Barrier Category	Frequency	Percentage	Key Components
Skills & Training Gap	48	27.4%	Lack of skilled personnel, inadequate training, knowledge deficiencies
Resistance to Change	37	21.1%	Staff fears, job displacement concerns, comfort with existing processes
Cost & Resource Constraints	32	18.3%	High implementation costs, unclear ROI, budget limitations
Data & Quality Issues	26	14.9%	Poor data quality, inconsistent sources, governance challenges
Technical Complexity	23	13.1%	Implementation challenges, infrastructure requirements

Based on Table 6, Skills & Training Gap emerged as the most frequently cited barrier (48 mentions, 27.4%), encompassing multiple dimensions including lack of implementation-capable personnel, insufficient technical knowledge, limited access to quality training programmes, and significant gaps between theoretical knowledge and practical application capabilities. This finding directly supports the regression analysis results and confirms that skills development represents a fundamental challenge requiring systematic intervention.

Resistance to Change constituted the second most significant barrier (37 mentions, 21.1%), capturing cultural and psychological obstacles including staff fear of job displacement, comfort with existing processes, and organisational inertia. This barrier category reflects the human dimension of technology adoption and suggests that change management strategies must address emotional and cultural factors alongside technical considerations.

Cost & Resource Constraints represented substantial concerns (32 mentions, 18.3%), particularly relevant within the South African economic context where organisations may face resource limitations that constrain technology investment capabilities.

In addition, based on Table 7, Leadership & Management Support emerged as the most critical enabler (8 mentions, 34.8%), emphasising the essential role of executive commitment and visible endorsement in facilitating successful adoption. This finding directly addresses the management support gap identified in the Social Influence analysis and confirms the importance of leadership engagement for implementation success.

Table 7 Primary Enablers for RPA Adoption

Enabler Category	Frequency	Percentage	Key Components
Leadership & Management Support	8	34.8%	Management commitment, strategic alignment, resource allocation
Training & Skills Development	5	21.7%	Comprehensive training programmes, competency building
Communication & Change Management	5	21.7%	Transparent communication, stakeholder engagement
Collaboration & Teamwork	4	17.4%	Cross-functional cooperation, peer support
Investment & Resources	1	4.3%	Adequate funding, infrastructure development

The prominence of Training & Skills Development, and Communication & Change Management as enablers (5 mentions each, 21.7%) reinforces the importance of comprehensive workforce development and systematic stakeholder engagement in overcoming adoption barriers.

Discussion

The convergence of the quantitative and qualitative findings reveals several noteworthy insights that both align with and diverge from existing technology adoption literature, while providing important contextual understanding of RPA adoption dynamics within the South African accounting profession.

The prominence of Social Factors

The findings revealed social factors as the most dominant in predicting adoption intentions making it the most significant driver of the UTAUT constructs. This pattern suggests that RPA adoption in South African accounting contexts may operate more as a social phenomenon than a purely technological one, where peer validation, management endorsement, and professional community support collectively outweigh technical considerations in shaping adoption decisions. This finding contradicts the findings recorded by studies conducted in more technologically mature markets. Kim et al., 2024, examining AI system adoption among South Korean firms, found that while social factors mattered, performance benefits were the primary adoption driver in that context. Similarly, research in developed Western markets tends to emphasize technical performance and efficiency gains as paramount considerations (Cooper et al., 2019). The divergence observed in this study may reflect contextual differences between emerging and developed economies, where unfamiliarity with RPA technologies and limited successful implementation examples may heighten reliance on social validation mechanisms to reduce perceived risk.

However, the prominence of social factors does align with findings from Sethibe and Naidoo (2022), who examined robotics adoption among South African audit firms and similarly identified social influences as significant drivers, though their study also

emphasized facilitating conditions due to their organizational-level focus. The consistency between these studies conducted in the same national context but examining different professional segments suggests that social legitimation processes may be particularly salient in South African professional services environments, possibly reflecting cultural factors, professional norms, or the early-stage nature of automation adoption in this region.

This pattern also resonates with broader professional services research suggesting that reputation and peer legitimacy carry enhanced weight in contexts where professional judgment and client confidence are paramount. As noted by Rogers (2003) in diffusion of innovation theory, social systems and communication networks play critical roles in technology adoption, particularly during early adoption phases characterized by high uncertainty. The South African accounting profession appears to exemplify this dynamic, where collective professional validation may be necessary before individuals commit to adopting unfamiliar automation technologies.

The Awareness-Implementation Paradox

The substantial gap observed between RPA awareness and regular usage represents another critical finding that appears to challenge linear technology adoption models. While respondents demonstrated generally good knowledge of RPA and expressed positive attitudes toward its potential, actual usage rates remained limited. This pattern suggests that awareness and favorable attitudes, while necessary, constitute insufficient conditions for behavioral change in complex organizational environments.

Similar awareness-implementation gaps have been documented in other contexts. Yigitbasioglu et al. (2023) observed comparable patterns in management accounting technology adoption, noting that knowledge of advanced analytics techniques did not necessarily translate into their practical application. Lois et al. (2020), examining Greek accountants' adoption of new technologies during economic uncertainty, similarly found disconnects between awareness and implementation. These parallel findings across different national contexts and accounting specializations suggest that the awareness-implementation gap may represent a common challenge in professional services technology adoption rather than a context-specific anomaly.

The gap implies that traditional awareness-building interventions, while valuable, may yield limited returns in terms of actual adoption without addressing the intermediate mechanisms that bridge knowledge and practice. These mechanisms appear to include experiential learning opportunities, peer support networks, management commitment, and systematic removal of implementation barriers—factors highlighted in both the quantitative regression results and qualitative barrier analysis.

Usability Considerations in Emerging Markets

The significant role of Effort Expectancy in predicting adoption intentions diverges somewhat from patterns observed in more digitally mature markets. Tiberius and Hirth

(2019), studying German auditors, found that usability concerns were relatively minor given high baseline digital competence. In contrast, the present study suggests that perceived ease of use and learning requirements represent substantial considerations for South African accounting professionals.

This difference likely reflects variations in baseline digital literacy and technology exposure. In developing economy contexts where access to technology during professional education may be more variable, concerns about implementation complexity and skill requirements may be heightened. The finding aligns with Kim et al. (2024), who also identified effort expectancy as significant, and supports Sethibe and Naidoo (2022) emphasis on training as a critical adoption enabler in the South African context.

The prominence of usability concerns underscores the importance of user-centered design principles and comprehensive training programs in RPA implementation strategies for emerging markets. Organizations seeking to advance adoption may need to invest more heavily in skills development and change management compared to their counterparts in more digitally mature environments.

Performance Benefits: Present but Secondary

The marginal significance of Performance Expectancy presents an intriguing finding that requires careful interpretation. While performance benefits demonstrated some association with adoption intentions, this relationship appeared weaker than might be expected based on traditional technology adoption theories and evidence from other contexts.

This pattern contrasts markedly with studies in more established RPA markets. Cooper et al. (2019) found performance expectations central to adoption decisions among U.S. auditors, while Zhang (2020) documented similar patterns in China. The difference may reflect South Africa's early-stage adoption environment, where limited experiential evidence constrains professionals' ability to accurately assess performance benefits. Innovation Diffusion Theory (Rogers, 2003) suggests that perceived relative advantage typically gains prominence as technologies mature and evidence of benefits accumulates through observable successful implementations.

Alternatively, the secondary role of performance expectations may indicate that in professional services contexts, particularly during early adoption phases, technical performance considerations are genuinely overshadowed by social legitimation processes. Professionals may recognize RPA's potential benefits intellectually but require social validation and organizational support before performance considerations translate into adoption intentions.

Skills Development as a Structural Challenge

The identification of skills and training gaps as the most frequently cited adoption barrier transcends simple training deficiencies to reveal what appears to be a fundamental

structural challenge. The qualitative analysis revealed a self-reinforcing cycle: organizations hesitate to invest in RPA without skilled personnel, while professionals cannot develop skills without organizational investment in technology and training infrastructure.

This finding resonates with Sethibe and Naidoo (2022), who similarly identified training inadequacy as a significant barrier among South African audit firms. However, the present study's broader scope across accounting specializations suggests this challenge extends beyond auditing to encompass the full accounting profession. In contrast, studies in developed markets tend to emphasize infrastructure and integration challenges over workforce development concerns (Kim et al., 2024), suggesting that skills constraints may be particularly acute in emerging economy contexts.

The structural nature of the skills challenge implies that individual organization-level interventions may prove insufficient. Effective responses likely require ecosystem-level coordination involving professional bodies, educational institutions, technology vendors, and employers working collaboratively to develop implementation capabilities across the profession.

Organizational Readiness Gaps

The non-significance of Facilitating Conditions in predicting behavioral intentions, combined with low descriptive scores for organizational readiness, presents an apparent paradox requiring nuanced interpretation. While organizational support did not significantly predict intentions in the regression analysis, the qualitative data clearly identified resource constraints and inadequate organizational infrastructure as substantial barriers.

This pattern may be explained by considering the distinction between intention formation and actual implementation. When professionals form adoption intentions, they may focus primarily on social validation and personal capability considerations, with organizational resource availability becoming salient only during implementation attempts. This interpretation aligns with Kokina and Blanchette (2019), who documented high RPA project failure rates often attributable to organizational preparation deficiencies that emerge during implementation rather than planning phases.

The finding diverges from some previous UTAUT applications where facilitating conditions emerged as significant predictors (Kim et al., 2024; Sethibe & Naidoo, 2022). This variation may reflect methodological differences—organizational-level studies may emphasize infrastructure more heavily than individual-level intention studies—or contextual factors specific to the South African professional services environment.

Gender and Demographic Considerations

The absence of significant gender effects on technology perceptions aligns with recent evidence suggesting narrowing gender gaps in professional technology adoption. This

finding contrasts with earlier technology adoption research that frequently identified gender as a moderating variable, but appears consistent with contemporary studies in professional contexts (Awang et al., 2022). The convergence may reflect cohort effects, with younger professionals having more uniform technology exposure during education regardless of gender, or may indicate that professional training and credentialing processes create relatively standardized technology orientations across demographic groups.

Theoretical and Practical Implications

Overall, the findings suggest that while UTAUT provides a valuable framework for understanding RPA adoption, the relative importance of its constructs varies substantially across contexts. Certain patterns like the awareness-implementation gap and skills barriers appear to exhibit cross-national consistency, while others vary markedly between developed and emerging markets. The prominence of Social Influence in this study challenges technology-centric adoption models developed primarily in Western contexts and underscores the necessity of context-sensitive frameworks that account for social validation mechanisms prevalent in emerging market professional services environments. The study contributes to ongoing theoretical development by demonstrating that professional services contexts, particularly in developing economies, may exhibit adoption dynamics that diverge from patterns observed in consumer contexts or developed market organizations. Future research might benefit from explicitly incorporating contextual factors such as technological maturity, professional culture, and economic development levels into technology adoption frameworks, rather than treating these as background conditions.

From a practical standpoint, the findings provide several important implications for organizations and professional bodies seeking to advance RPA adoption. The dominance of social factors suggests that implementation strategies should prioritize social network activation, champion development, and community building over purely technical training. The awareness-implementation gap indicates that interventions must address intermediate mechanisms including experiential learning opportunities, peer support networks, and systematic barrier removal. The prominence of skills challenges points to the need for ecosystem-level workforce development initiatives involving coordination among professional bodies, educational institutions, and employers. Finally, while organizational readiness may not directly influence intentions, it remains critical for translating intentions into sustained implementation success.

Conclusion

This study examines factors influencing RPA adoption among 100 South African accounting professionals using the UTAUT framework, achieving all primary research objectives through comprehensive quantitative and qualitative analysis. The research makes significant theoretical and practical contributions by validating the UTAUT model within a previously underexplored context while revealing context-specific patterns that

challenge conventional technology adoption assumptions. The most significant finding is the emergence of Social Influence as the dominant predictor of adoption intention substantially outweighing traditional technology-focused performance expectation. This finding fundamentally challenges technology-centric adoption models and suggests that professional services contexts exhibit unique dynamics that emphasise social legitimacy and peer validation over technical features. The research also uncovered a substantial awareness-implementation gap, with respondents demonstrating good RPA knowledge and mostly engaging in its regular usage. This paradox challenges linear adoption models and suggests that bridging the gap between awareness and implementation requires additional intervening mechanisms beyond traditional training approaches. Systematic barrier analysis suggested skills and training as a gap representing a structural challenge that transcends simple training deficiencies. The prominence combined with low organisational readiness scores implies that successful RPA adoption requires coordinated ecosystem-level interventions rather than individual organisation initiatives.

Limitations

The study acknowledges several limitations in interpreting these findings. The cross-sectional design provides only a snapshot of current attitudes and intentions, limiting the ability to track adoption progression over time. The sample, while diverse, concentrated on internal audit with limited representation from other specialised areas like tax consulting and forensic accounting. Geographic distribution may not have fully captured the diversity across all South African regions, particularly smaller towns and rural areas where technological infrastructure and professional services maturity may differ significantly. The rapid pace of RPA technology development means current findings represent a specific point in time, and barriers such as complexity and cost may diminish as technologies evolve.

Recommendation and study implications

Based on the research findings, several evidence-based recommendations emerge for different stakeholder groups. For Accounting Organisations, we recommend implementing social-first adoption strategies that prioritise social factor development over technical features. Establish internal champion programmes, ensure visible management endorsement, and create peer learning communities to leverage the dominance of Social Influence in driving adoption decisions. To address skills gaps through experiential learning, it is recommended to implement "RPA Sandbox" environments where professionals can safely experiment with automation tools before formal implementation. Partner with technology vendors for hands-on training and establish progressive competency development frameworks. We recommend for professional bodies to integrate RPA into continuing professional development and establish industry benchmarking. Policymakers are also encouraged to invest in technological infrastructure and regulatory frameworks that support RPA adoption while maintaining professional standards and ethical requirements. This research extends UTAUT theory by demonstrating context-specific patterns that challenge traditional construct hierarchies. The dominance of Social Influence over Performance Expectancy suggests that technology

adoption theories may need refinement for professional services contexts where social legitimacy and peer validation carry enhanced importance. The awareness-implementation gap framework contributes to technology adoption theory by highlighting the complex progression from awareness to usage, suggesting that intermediate mechanisms such as experiential learning and social support may be essential for successful implementation.

The findings provide evidence-based guidance for implementation strategies that prioritise social factors over technical considerations. The research demonstrates that successful RPA adoption requires comprehensive ecosystem approaches addressing individual, organisational, and industry-level factors simultaneously. The identification of skills gaps as a structural challenge suggests that individual organisation training programmes, while necessary, may be insufficient without coordinated industry-level workforce development initiatives involving professional bodies, educational institutions, and technology vendors.

Several opportunities emerge for extending this research. Longitudinal studies could trace the full trajectory of RPA adoption from initial awareness through sustained usage, providing insights into how adoption drivers evolve over time. Cross-cultural comparative studies could examine how adoption patterns vary across different economic and cultural contexts. As RPA technologies increasingly integrate artificial intelligence and machine learning capabilities, future research should examine how these advancements influence adoption patterns and alter skill requirements. The intersection of RPA with emerging technologies such as blockchain presents additional opportunities for understanding integrated digital solution adoption. The findings establish a foundation for ongoing research into professional services technology adoption while providing practical guidance for stakeholders seeking to advance digital transformation within the accounting profession. By addressing the identified barriers and leveraging the enablers, organisations and professional bodies can develop more effective strategies for successful RPA implementation in accounting practice.

Appendix

Appendix 1: Questionnaire Instrument used

Questionnaire: The use of Robotics Automation in the Accounting Profession.
Section A: Participant Details
1.Age
1.1) below 18
1.2) 18-20
1.3) 21-30
1.4) 31-40
1.5) 41-50
1.6) 51-65
1.7) 66- 70
2.Gender
2.1) Male
2.2) Female
2.3) Prefer not to say
2.4) Other (please specify)
3.Highest Educational Background
3.1) Matric
3.2) Diploma
3.3) Bachelor's degree
3.4) Honours Degree
3.5) Masters Degree
3.6) Doctorate
3.7) Other(please specify)
4.Certification
4.1) CA(SA)
4.2) CISA
4.3) CIA
4.4) ACCA
4.5) CMA
4.6) CFE
4.7) Other (Please specify)
5.Are you in a management or non-management position ?
5.1) Yes
5.2) No
6.Please indicate/state what best describes your professional area(s) of work?
6.1) Finance
6.2) Internal Audit
6.3) External Audit
6.4) Other (Please specify)
7.Kindly rate your basic general computer knowledge on a scale of 1-5 for very poor to very good
8.Kindly describe your knowledge of robotics on a scale of 1-5 for very poor to very good
9.How long have you used robotics?

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9.1) Never
9.2) 0-1 years
9.3) 2-3 Years
9.4) 4-5 Years
9.5) More than 6 years
10.How long have you been in the accounting profession (Auditing, Financial/ Management Accounting)?
10.1) 0-1 years
10.2) 2-3 Years
10.3) 4-5 Years
10.4) 6-10 years
10.4) More than 10 years
11.How often do you use robotics in your daily work?
11.1) Rarely (Less than 5 assignments)
11.2) Moderate (between 5 -10 assignments)
11.3) Frequently (More than 10 assignments a year)
11.4) Always (On every assignment)
11.5) Never

Section B: The section of the questionnaire examines the respondent’s attitude, perceived usefulness, effort expectancy, social and facilitating conditions for using Robotics automation when performing tasks.

The items will be rated using a 5-point Likert scale ranging from 1: Strongly Disagree; 2: Disagree; 3: Neutral; 4: Agree; 5: Strongly Agree.

B1	General Awareness, Attitude and Trust between Robots and Accounting Professionals	1-SD	2-D	3-N	4-A	5-SA
1	I believe that robots will provide value when performing tasks?					
2	I would like to use a robot when performing tasks?					
3	I would trust the results provided from a robot when performing tasks?					
4	I would feel comfortable working with robots?					
5	I believe that using robotics to perform daily tasks will reduce costs?					
6	Robotics will be capable of providing real-time assurance?					
7	I believe that robots will provide reliable results for tasks that are repetitive better than humans?					
8	I believe that robots will provide reliable results for tasks requiring completion, outperforming humans in areas such as speed, cost, or accuracy?					
9	I believe that robots are capable of performing tasks requiring advanced cognitive functions,					

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B1	General Awareness, Attitude and Trust between Robots and Accounting Professionals	1-SD	2-D	3-N	4-A	5-SA
	such as applying professional judgment, to provide reliable results?					
10	I believe that robots, will be used to complement the work of accounting professionals in the future?					
11	My organisation is currently using or planning to use robotics as part, of its current strategic goals?					
B2	Performance Expectancy	1-SD	2-D	3-N	4-A	5-SA
12	Robots are useful in the audit environment?					
13	A robot would enable professional accountants to accomplish tasks more quickly?					
14	I could Save much time at work by using a robot?					
15	I would improve my performance using robots as, it will reduce errors?					
16	Robots will increase the value that I provide in my work?					
17	Having a robots would allow me to use my time accomplish other tasks?					
B3	Effort Expectancy	1-SD	2-D	3-N	4-A	5-SA
18	I like learning about robotics?					
19	Robotic technologies are easy to use?					
20	learning to use robots to perform accounting work is easy?					
21	I have the technical skills needed to use a robot in performing professional accounting services work?					
22	Applying the use of robotics to perform daily tasks would be easy?					
23	Using a robot will make my work easier?					
B4	Social Factors	1-SD	2-D	3-N	4-A	5-SA
24	My organisation supports the use of robots for professional accounting services?					
26	Using a robot at work would indicate me having a higher status than those who do not?					
27	My manager supports the use of robots?					
28	Using a robot will advance my career progression (promotions, opportunities, remuneration)?					
29	The auditing communities that I participate in supports the use of robotics in auditing (IIA, ISACA, IRBA or any other auditing communities to which you belong)?					
30	The expectations of my business partners or clients are that professional accountants should					

B1	General Awareness, Attitude and Trust between Robots and Accounting Professionals	1-SD	2-D	3-N	4-A	5-SA
	use robotics in performing routine work or audits?					
B5	Facilitating Conditions	1-SD	2-D	3-N	4-A	5-SA
31	My organisation has structures to support learning and using robotics?					
32	There are government and country-wide initiatives across South Africa supports the use of robotics in the accounting profession?					
33	My organisation has the necessary funds available for me to learn or use robotics for accounting and processing transactions?					
34	My organisation has the necessary skills to start using robotics in accounting profession?					
35	I have access to the relevant support should I need help when problems are encountered when using robotics?					
B6	Behavioural Intention	1-SD	2-D	3-N	4-A	5-SA
36	I intend using robotics in performing daily accounting routine work in the next 12 months?					
37	I predict that robots will be used in my organisations for performing daily routine work in the next 24 months?					
38	I intend learning to use robotics in the next 12 months?					

Section C: The section of the questionnaire examines the respondent’s perception of the top three barriers and enablers for using robotics in the accounting profession.

C	Barriers and Enablers for Adoption of Robotics in Auditing
38	What are the barriers that would affect your use of robotics process automation as an accounting professional
39	Kindly state what you think are the enablers of your use of robotics process automation as an accounting professional.

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Conflicts of Interest

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