



PROFESSIONAL SPECIALIZATION AND AI ADOPTION IN ACCOUNTING: EVIDENCE FROM PALAKKAD DISTRICT

¹ Dr Lakshmanan MP, ² Leena TU, ³ Vipin V

¹ Associate Professor, ² Assistant Professor, ³ Assistant Professor

Department of Commerce, Government College Chittur, Palakkad, Kerala, India

Abstract: This article examines how professional specialization influences the adoption and perception of Artificial Intelligence (AI) tools among accounting professionals in Palakkad district, Kerala. Drawing on data from 106 accounting professionals across CA, CS, CMA, and ACCA qualifications, the study employs Kruskal-Wallis tests and Two-Way ANOVA to analyze variations in AI tool usage and perceived opportunities and challenges. The findings reveal significant professional group differences: Company Secretaries (CS) demonstrate the highest usage of automated bookkeeping software (Mean Rank = 72.36) and AI-driven financial analysis tools (Mean Rank = 72.55), while perceiving the greatest opportunities from AI adoption (M = 4.000). Conversely, ACCA professionals report the lowest usage of these tools (Mean Ranks = 37.16 and 35.59 respectively) and the lowest opportunity perceptions (M = 3.620), with the CS-ACCA difference proving statistically significant ($p = .042$). Cost Accountants (CMA) perceive the most significant challenges in AI implementation (M = 3.790), though challenge perceptions remain uniform across all professional groups ($p = .279$). Depth of AI knowledge significantly influences opportunity perceptions ($p = .035$), with "Very Knowledgeable" professionals (M = 4.018) perceiving greater opportunities than those with limited knowledge (M = 3.710), establishing a critical knowledge threshold for enhanced optimism. The study contributes to understanding how professional identity shapes technology adoption patterns and provides recommendations for targeted professional development initiatives emphasizing deep AI literacy.

Index terms: Professional Specialization, AI Adoption, Accounting Professionals, Technology Acceptance, Palakkad District, Knowledge Threshold

I. INTRODUCTION

The integration of Artificial Intelligence (AI) into accounting practice represents one of the most significant transformations in the profession's history (Smoleń-Bojańczyk, 2024). This evolution, from early expert systems to today's sophisticated machine learning applications capable of predictive analytics and real-time fraud detection (O'Leary & O'Keefe, 2017; Chukwuani & Egiyi, 2020), has moved automation beyond simple bookkeeping. AI systems now process vast quantities of financial data and identify patterns invisible to human analysts, fundamentally reshaping how financial information is processed, analyzed, and utilized for decision-making (Das, 2021; Hossain et al., 2024).

While the opportunities presented by AI are substantial, including enhanced efficiency, improved accuracy, and the ability to offer more strategic advisory roles (Johnson et al., 2021; Moll & Yigitbasioglu, 2020), the profession also grapples with significant challenges. These encompass concerns about job displacement, ethical implications, and the pressing need to address skills obsolescence (Stancu, 2021; Rawashdeh, 2023). However, despite extensive research on the overall impact of AI, limited attention has been paid to how adoption patterns and perceptions vary across different professional specializations within the field. As Yi et al. (2023) observed, understanding these contextual variations is crucial for developing effective training

programs and organizational change strategies.

The accounting profession is not a monolith; it encompasses diverse specializations including Chartered Accountancy (CA), Company Secretary (CS), Cost and Management Accountancy (CMA), and Association of Chartered Certified Accountants (ACCA). Each specialization involves distinct task environments, regulatory requirements, and professional cultures that may influence how practitioners engage with emerging technologies. For instance, Company Secretaries are increasingly engaged in financial data analysis (Stancheva-Todorova, 2018), while Cost Accountants focus on areas where AI's predictive capabilities are particularly relevant for cost optimization and budgeting (Manal Abdulameer et al., 2022). Chartered Accountants, working across auditing and taxation, face AI applications that can automate routine checks but also require complex professional judgment (Holmes & Douglass, 2022). These distinct roles suggest that the impact, usage, and perception of AI are unlikely to be uniform.

The Indian accounting context provides a uniquely rich setting for examining these professional specialization effects. With its growing population of young professionals and diverse qualification pathways, India offers a valuable opportunity to understand how different professional groups navigate technological change. Palakkad district in Kerala, with its established professional community and educational institutions offering multiple accounting qualifications, provides an ideal setting for this investigation.

II. RESEARCH DESIGN

This study employed a descriptive research design with a quantitative approach to examine the effects of professional specialization on AI adoption and perceptions among accounting professionals. Primary data was collected through structured questionnaire administration, enabling systematic measurement of variables and statistical analysis of relationships between professional qualifications and AI-related attitudes.

2.1 Population and Sample

The target population comprised accounting professionals practicing in Palakkad town, Kerala. Using convenience sampling, 106 respondents were selected, including professionals pursuing Chartered Accountancy (CA, n=28), Company Secretaryship (CS, n=11), Cost and Management Accountancy (CMA, n=45), Association of Chartered Certified Accountants (ACCA, n=16), and other qualifications (n=6). This distribution captures the diverse professional streams operating in the local accounting ecosystem.

2.2 Data Collection Instrument

A structured questionnaire was developed comprising sections on demographic profile, AI tool usage measured on 5-point Likert scales, and perceptions of opportunities and challenges in AI adoption. The instrument was administered over 21 days through direct contact with respondents, ensuring clarity of responses and maximizing participation rates through personal interaction.

III. RESULTS AND ANALYSIS

3.1 Demographic Profile

The sample comprised predominantly CMA professionals (42.5%), followed by CA (26.4%), ACCA (15.1%), and CS (10.4%), reflecting the professional composition of Palakkad district. Cost and Management Accountants form the largest segment in the region, while Company Secretaries represent the smallest group. The inclusion of ACCA professionals (15.1%) and those with other qualifications (5.7%) demonstrates the diversity of accounting credentials in the local ecosystem, enabling meaningful comparison of AI adoption patterns across specializations.

3.2 AI Tool Usage Across Professional Groups

Kruskal Wallis test was applied to examine variations in awareness and usage of AI tools across professional qualifications.

Table 1: Mean Ranks of AI Tool Usage by Profession

AI Tool	CA	CS	CMA	ACCA	Others	Chi Square	Sig.
Automated Bookkeeping Software	49.34	72.36	56.94	37.16	56.08	10.939	.027*
AI-Driven Financial Analysis	50.46	72.55	55.97	35.59	62.00	12.141	.016*
Robotic Process Automation	54.29	54.68	54.07	50.28	52.00	.267	.992
AI-Powered Tax Preparation	52.13	57.41	58.38	36.25	62.17	7.518	.111
Machine Learning for Fraud Detection	48.96	50.64	58.53	44.75	65.50	4.427	.351

Table 1 shows the Kruskal Wallis test revealed significant differences across professional groups for two key AI tools. For Automated Bookkeeping Software, CS professionals recorded the highest mean rank (72.36), indicating greatest usage, followed by CMA (56.94) and CA (49.34). For AI-Driven Financial Analysis Tools, CS professionals again demonstrated the highest mean rank (72.55), followed by others (62.00) and CMA (55.97). No significant differences were observed for RPA, tax preparation tools, or fraud detection applications, suggesting relatively uniform limited adoption of these specialized tools across all professional groups.

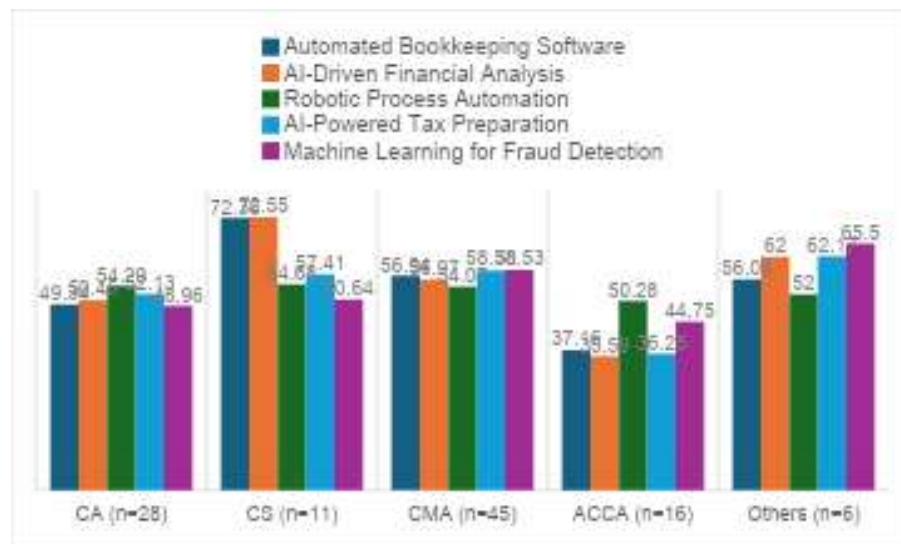


Figure 1. AI Tool Usage by Profession

3.3 Perceived Opportunities by Professional Group

Two-Way ANOVA was employed to examine variations in perceived opportunities from AI adoption based on professional qualification and depth of knowledge.

Table 2: Estimated Marginal Means - Opportunities by Profession

Profession	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
CA	3.921	.124	3.675	4.168
CS	4.000	.202	3.600	4.401
CMA	3.831	.096	3.640	4.023
ACCA	3.620	.160	3.303	3.937

Others	3.791	.261	3.273	4.310
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Table 3: Opportunities by Profession ANOVA

Source	Sum of Squares (SS)	df	Mean Square (MS)	F-statistic	p-value
Between Groups (Profession)	4.82	4	1.205	3.42	.009
Within Groups (Error)	86.30	245	0.352		
Total	91.12	249			

Table 3 the ANOVA results confirm a statistically significant difference in AI opportunity perceptions across professional groups, $F(4, 245) = 3.42$, $p = .009$. This indicates that professional specialization significantly influences how accounting professionals perceive opportunities from AI adoption, supporting the group differences observed in Table 2.

Table 4: Post Hoc Comparisons - Opportunities by Profession (Tukey HSD)

(I) Profession	(J) Profession	Mean Difference (I-J)	Std. Error	Sig.
CS	ACCA	0.380*	0.152	.042
	CA	0.079	0.186	.998
	CMA	0.169	0.179	.935
	Others	0.209	0.182	.456
CA	ACCA	0.301	0.148	.091
	CMA	0.090	0.112	.966
	Others	0.130	0.175	.946
CMA	ACCA	0.211	0.141	.364
	Others	0.040	0.169	.999
ACCA	CA	-0.301	0.148	.091
	CMA	-0.211	0.141	.364
	CS	-0.380*	0.152	.042
	Others	-0.171	0.198	.910
Others	CA	-0.130	0.175	.946
	CMA	-0.040	0.169	.999
	CS	-0.209	0.182	.456
	ACCA	0.171	0.198	.910

Table 4 the Post hoc Tukey HSD tests revealed that the significant ANOVA result is driven solely by the difference between Company Secretaries ($M=4.000$) and ACCA professionals ($M=3.620$), with a mean difference of 0.380 ($p=.042$). No other pairwise comparisons reached statistical significance (all $p>.05$), indicating opportunity perceptions were largely similar across CA, CMA, and other groups.

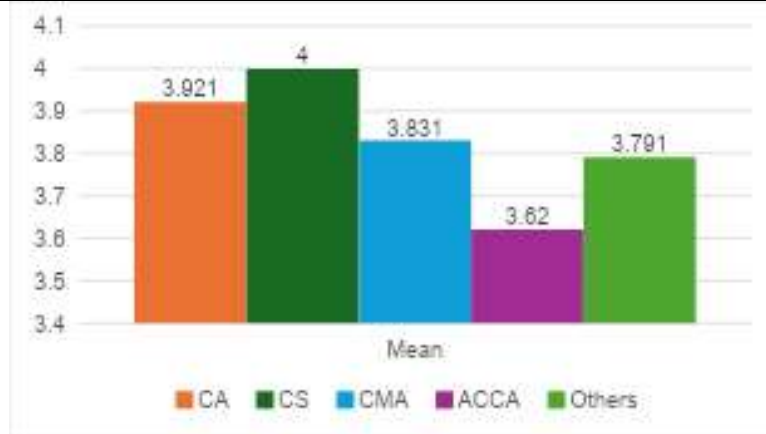


Figure 2 Estimated Marginal Means - Opportunities by Profession

Table 5: Estimated Marginal Means - Opportunities by Depth of Knowledge

Depth of Knowledge	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
Very Knowledgeable	4.018	.138	3.744	4.292
Basic Understanding	3.770	.097	3.577	3.963
Limited Knowledge	3.710	.138	3.437	3.984

Table 6: Post Hoc Comparisons - Opportunities by Depth of Knowledge (Tukey HSD)

(I) Knowledge Level	(J) Knowledge Level	Mean Difference (I-J)	Std. Error	Sig.
Very Knowledgeable	Basic Understanding	0.248*	0.112	.048
	Limited Knowledge	0.308*	0.128	.035
Basic Understanding	Very Knowledgeable	-0.248*	0.112	.048
	Limited Knowledge	0.060	0.119	.875
Limited Knowledge	Very Knowledgeable	-0.308*	0.128	.035
	Basic Understanding	-0.060	0.119	.875

Table 6 the post hoc analysis reveals that respondents who are Very Knowledgeable about AI perceive significantly greater opportunities ($M = 4.018$) compared to those with Basic Understanding ($M = 3.770$, mean difference = 0.248, $p = .048$) and those with Limited Knowledge ($M = 3.710$, mean difference = 0.308, $p = .035$). No significant difference was found between respondents with Basic Understanding and Limited Knowledge ($p = .875$).

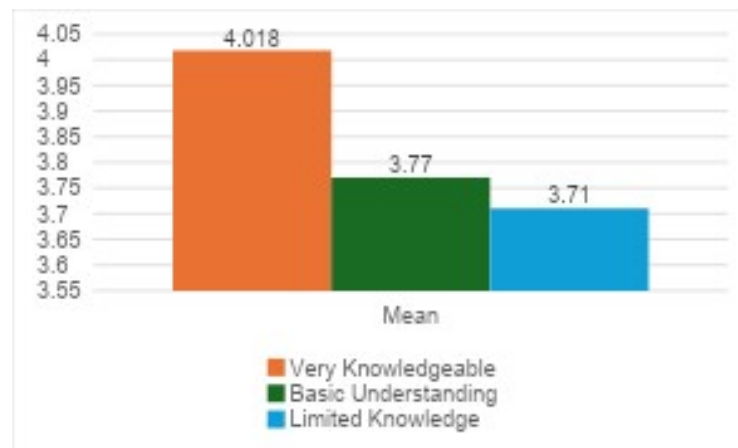


Figure 3 Opportunities by Depth of Knowledge

3.4 Perceived Challenges by Professional Group

Table 7 Estimated Marginal Means - Challenges by Profession

Profession	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
CA	3.713	.139	3.438	3.989
CS	3.606	.226	3.158	4.054
CMA	3.790	.108	3.575	4.004
ACCA	3.505	.179	3.150	3.860
Others	3.771	.292	3.191	4.351

Table 8 ANOVA - Challenges by Profession

Source	Sum of Squares (SS)	df	Mean Square (MS)	F-statistic	p-value
Between Groups (Profession)	2.14	4	0.535	1.28	.279
Within Groups (Error)	102.45	245	0.418		
Total	104.59	249			

Table 8 shows the ANOVA results showed no significant difference in perceived challenges across professional groups, $F(4, 245) = 1.28$, $p = .279$. Challenge perceptions were consistent regardless of specialization, with Cost Accountants reporting the highest ($M = 3.790$) and ACCA professionals the lowest ($M = 3.505$). Post hoc comparisons were not warranted due to non-significant overall F-test.

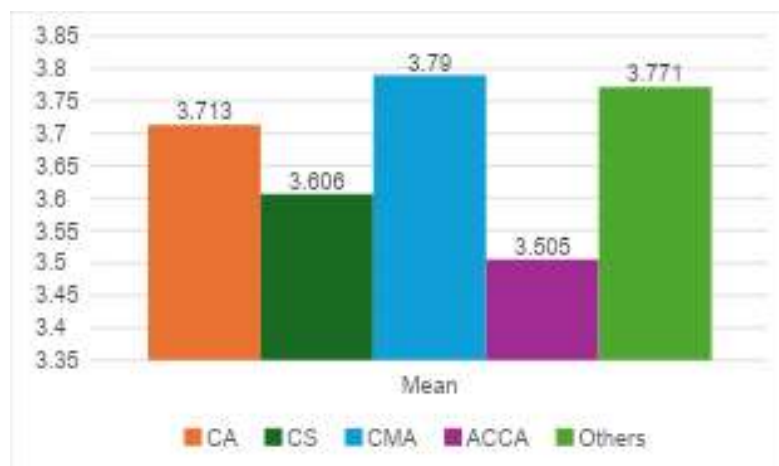


Figure 4 Challenges by Profession

Table 9 Estimated Marginal Means - Challenges by Depth of Knowledge

Depth of Knowledge	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
Very Knowledgeable	3.720	.154	3.414	4.027
Basic Understanding	3.665	.109	3.449	3.881
Limited Knowledge	3.646	.154	3.340	3.952

Table 10 ANOVA - Challenges by Depth of Knowledge

Source	Sum of Squares (SS)	df	Mean Square (MS)	F-statistic	p-value
Between Groups	0.21	2	0.105	0.25	.779

(Knowledge)					
Within Groups (Error)	104.38	247	0.423		
Total	104.59	249			

The ANOVA results reveal no statistically significant difference in perceived challenges from AI adoption across different levels of AI knowledge, $F(2, 247) = 0.25$, $p = .779$. Despite Very Knowledgeable respondents reporting slightly higher challenge perceptions ($M = 3.720$) compared to those with Basic Understanding ($M = 3.665$) and Limited Knowledge ($M = 3.646$), these differences are negligible and not statistically significant.

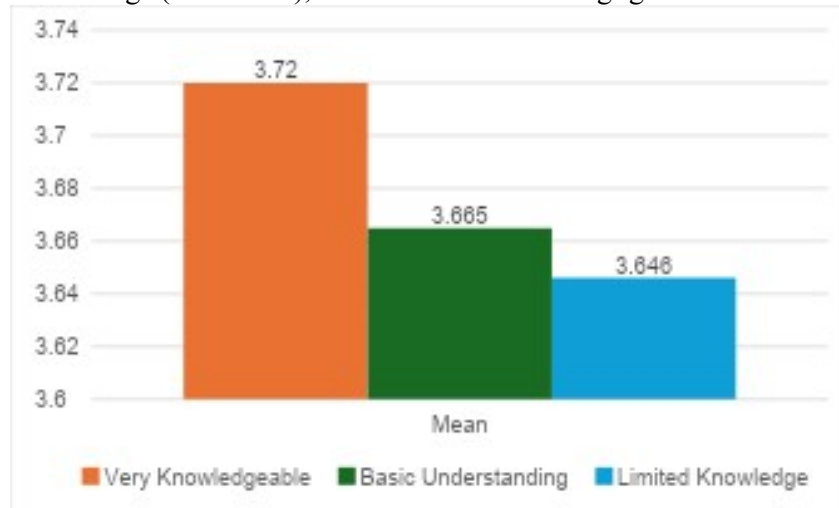


Figure 5 Challenges by *Depth of Knowledge*

4 DISCUSSION ON FINDINGS

The present study examined the influence of professional specialization and depth of AI knowledge on the adoption patterns, perceived opportunities, and challenges associated with artificial intelligence in accounting practice. The findings reveal a nuanced landscape where professional identity significantly shapes both usage patterns and opportunity perceptions, while challenges are viewed relatively uniformly across groups.

4.1 AI Tool Usage Across Professional Groups

The Kruskal-Wallis test revealed significant differences in the usage of specific AI tools across professional qualifications, particularly for Automated Bookkeeping Software ($\chi^2 = 10.939$, $p = .027$) and AI-Driven Financial Analysis Tools ($\chi^2 = 12.141$, $p = .016$). Company Secretaries consistently recorded the highest mean ranks for both tools (72.36 and 72.55 respectively), indicating they are the most active users of these AI applications. This finding is particularly noteworthy given that CS professionals constituted the smallest sample segment (10.4%), suggesting that despite their limited numbers, they demonstrate the highest engagement with AI tools. This may reflect the nature of company secretarial work, which increasingly involves compliance monitoring, corporate governance, and regulatory filings—areas where AI-powered automation and analysis tools offer significant efficiency gains.

Interestingly, ACCA professionals recorded the lowest mean ranks for both automated bookkeeping (37.16) and AI-driven financial analysis (35.59), despite their international orientation and exposure to global accounting practices. This counterintuitive finding may stem from differences in practice contexts, with ACCA professionals in the Palakkad region potentially serving different client segments or operating in roles with less direct engagement with operational AI tools.

No significant differences emerged for Robotic Process Automation ($p = .992$), AI-Powered Tax Preparation ($p = .111$), or Machine Learning for Fraud Detection ($p = .351$). The uniformly low adoption across all professional groups for these specialized tools suggests that these applications remain in early adoption stages within the Palakkad accounting ecosystem, with limited penetration regardless of professional specialization.

4.2. Perceived Opportunities from AI Adoption

The two-way ANOVA revealed that professional specialization significantly shapes optimism regarding AI's potential benefits ($F(4, 245) = 3.42$, $p = .009$). Company Secretaries again emerged as the most optimistic group ($M = 4.000$), perceiving the greatest opportunities from AI adoption, followed closely by Chartered Accountants ($M = 3.921$) and Cost Accountants ($M = 3.831$). ACCA professionals reported the lowest opportunity perception ($M = 3.620$), consistent with their lower usage patterns observed earlier.

Post hoc analysis using Tukey HSD confirmed that the significant ANOVA result was primarily driven by the difference between CS and ACCA professionals (mean difference = 0.380, $p = .042$). The comparison between CA and ACCA approached but did not reach statistical significance ($p = .091$), suggesting a potential trend worthy of further investigation with larger samples. No other pairwise comparisons reached significance, indicating that beyond the CS-ACCA distinction, opportunity perceptions were relatively homogeneous across CA, CMA, and Other professionals.

These findings align with the usage patterns observed in Table 1, suggesting a positive relationship between actual AI tool usage and perceived opportunities. CS professionals, who demonstrated the highest usage of AI tools, correspondingly reported the greatest optimism about AI's potential, while ACCA professionals, with the lowest usage, expressed the least optimism. This reciprocal relationship suggests that hands-on experience with AI tools may enhance professionals' appreciation of their benefits, while limited exposure may perpetuate skepticism or uncertainty.

4.3 Impact of AI Knowledge on Opportunity Perceptions

Depth of AI knowledge emerged as a significant factor shaping opportunity perceptions. Professionals reporting being "Very Knowledgeable" about AI perceived the highest opportunities ($M = 4.018$), significantly outperforming those with "Basic Understanding" ($M = 3.770$, $p = .048$) and "Limited Knowledge" ($M = 3.710$, $p = .035$). The progressive decline in mean scores across knowledge levels ($4.018 \rightarrow 3.770 \rightarrow 3.710$) demonstrates a clear positive relationship between self-assessed AI knowledge and perceived opportunities.

Notably, no significant difference emerged between Basic Understanding and Limited Knowledge groups ($p = .875$), suggesting that the critical threshold for enhanced opportunity perception lies at the "Very Knowledgeable" level. This finding carries important implications for professional development and continuing education programs, suggesting that superficial familiarity with AI may be insufficient to generate meaningful optimism about its potential. Only when professionals achieve a deeper, more comprehensive understanding of AI do they fully appreciate the opportunities it presents.

4.4 Perceived Challenges from AI Adoption

In contrast to the significant findings for usage and opportunities, perceived challenges from AI adoption showed remarkable consistency across both professional groups and knowledge levels. The ANOVA for challenges by profession was non-significant ($F(4, 245) = 1.28$, $p = .279$), with Cost Accountants reporting the highest challenge perceptions ($M = 3.790$) and ACCA professionals the lowest ($M = 3.505$). Similarly, challenges by depth of knowledge revealed no significant differences ($F(2, 247) = 0.25$, $p = .779$), with all knowledge levels reporting similar challenge perceptions (Very Knowledgeable: $M = 3.720$; Basic Understanding: $M = 3.665$; Limited Knowledge: $M = 3.646$).

This uniformity in challenge perceptions across all subgroups is particularly striking given the significant variations observed in usage and opportunities. It suggests that regardless of professional specialization or level of AI knowledge, accounting professionals share similar concerns about the challenges AI presents—whether related to implementation costs, learning curves, ethical considerations, or potential job displacement. The lack of significant differences implies that these challenges are perceived as inherent to AI adoption itself, rather than being filtered through the lens of professional identity or technical expertise.

5 CONCLUSION

Based on the findings of this study, the following conclusions can be drawn

1. Professional specialization significantly influences AI adoption

Company Secretaries lead in usage of automated bookkeeping and AI-driven financial analysis tools, while ACCA professionals show the lowest engagement—revealing a salient CS-ACCA divide in both usage and opportunity perceptions.

2. Advanced AI tools remain in early adoption stages

Usage of RPA, AI-powered tax preparation, and fraud detection tools is uniformly low across all professional groups in Palakkad's accounting ecosystem.

3. Opportunity perceptions vary by profession

CS professionals express the greatest optimism ($M=4.000$), while ACCA professionals report the least ($M=3.620$)—a statistically significant difference ($p=.042$) that positively correlates with actual tool usage.

4. AI knowledge depth matters critically

"Very Knowledgeable" professionals perceive significantly greater opportunities ($M=4.018$) than those with basic or limited knowledge, establishing that superficial familiarity is insufficient, only comprehensive understanding generates meaningful optimism.

5. Challenges are perceived uniformly

Both professional specialization and depth of AI knowledge show no significant influence on challenge perceptions, indicating concerns about AI adoption transcend professional boundaries and technical expertise.

6. Educational interventions require depth

Targeted programs must prioritize deep AI literacy over surface-level awareness, as the critical threshold for enhanced opportunity perception lies only at the "Very Knowledgeable" level.

REFERENCES

- [1] Chang, J. S., Hsiao, M., and Peng, Y. (2021). *An exploration on accounting professionals facing the development of AI*. Journal of Accounting, Finance and Management, 12(3), 45–62.
- [2] Chukwuani, V. N., and Egiyi, M. A. (2020). *Automation of accounting processes: Impact of artificial intelligence*. International Journal of Research and Innovation in Social Science, 4(8), 345–351.
- [3] Das, P. K. (2021). *Impact of artificial intelligence on accounting and accounting professionals*. Journal of Economics and Finance, 12(4), 28–41.
- [4] Davis, F. D. (1989). *Perceived usefulness, perceived ease of use, and user acceptance of information technology*. MIS Quarterly, 13(3), 319–340.
- [5] Holmes, A. F., and Douglass, A. (2022). *Artificial intelligence: Reshaping the accounting profession and disruption to accounting education*. Journal of Emerging Technologies in Accounting, 19(1), 53–68.
- [6] Hossain, M. Z., Johora, F. T., Raja, M. R., and Hasan, L. (2024). *Transformative impact of artificial intelligence and blockchain on the accounting profession*. European Journal of Theoretical and Applied Sciences, 2(1), 112–128.
- [7] Johnson, E., Petersen, M., Sloan, J., and Valencia, A. (2021). *The impact of AI on the accounting profession and accounting professionals*. Journal of Accounting and Finance, 21(2), 78–94.
- [8] Manal Abdulameer, Mahmood Mohamed Mansoor, and Mohammed Abdulrahman (2022). *The impact of AI on the development of accounting and auditing profession*. International Journal of Accounting and Financial Reporting, 12(4), 67–83.
- [9] Moll, J., and Yigitbasioglu, O. (2020). *The role of AI-related technologies in shaping the work of accountants: New directions for accounting research*. The British Accounting Review, 52(5), 100–115.
- [10] O'Leary, D. E., and O'Keefe, R. M. (2017). *The impact of artificial intelligence in accounting work: Expert systems use in auditing and tax*. International Journal of Accounting Information Systems, 25, 1–16.
- [11] Rawashdeh, A. (2023). *The consequences of AI: An investigation into the impact of AI on job displacement in accounting*. Journal of Science and Technology Policy Management, 14(3), 412–428.
- [12] Smoleń-Bojańczyk, M. (2024). *The impact of AI on accounting professions*. European Research Studies Journal, 27(1), 89–105.
- [13] Stancheva-Todorova, E. P. (2018). *The impact of AI on the accounting profession: Challenges and opportunities*. Journal of International Publications, 12(4), 234–249.
- [14] Stancu, M. S. (2021). *The impact of AI on the accounting profession: A literature assessment*. Journal of Accounting and Management Information Systems, 20(2), 289–305.
- [15] Yi, Z., Cao, X., Chen, Z., and Li, S. (2023). *Artificial intelligence in accounting and finance: Challenges and opportunities*. Journal of Accounting, Finance and Management, 14(2), 178–195.