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Factors Affecting Certified Public Accountants' Professional Audit Data Analytics Competency

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Abstract
The purpose of this research is to analyze the effect of audit learning diversity, comprehensive audit adroitness, audit technological attention, and stakeholder pressure intensity on each dimension of the professional audit data analytics competency of certified public accountants (CPAs in Thailand), who are facing an increasing velocity of data, particularly in the contest of real-time information. The data was collected from questionnaires distributed to 346 CPAs and descriptive statistics and inferential statistics were used to test the hypotheses. The results revealed that both audit learning diversity and comprehensive audit adroitness have a positive influence on all the components of professional audit data analytics competency. Moreover, audit technological attention has a significant positive influence on technology innovation adoption and stakeholder pressure intensity a significant positive influence on audit tactic intellectual, proactive control awareness, and personnel expertise orientation. This study can contribute to increasing auditors' awareness and enhancing audit data analytics competency in accordance with a fast-changing environment.

Keywords: Professional Audit Data Analytics Competency, Certified Public Accountant, Audit Process

1. Introduction

It is well-established that an audit becomes of benefit if it provides trusted information, is unbiased, and reflects a real picture of the audited firm (Dewu & Barghathi, 2019). One important challenge for audit professionals is how to add value to the client and information users when providing the audit service (Li, Dai, Gershberg, & Vasarhelyi, 2018). The world of audit is changing. Today's complex technology brings significant opportunities to the audit function. A firm's capacity to innovate is a fundamental aspect of its successful development (Richardson & Watson, 2021). Audit professional firms are no exception. Audit success is increasingly more dependent on the technologies and techniques that an audit firm can employ to analyze complex data and report insights for various applications intended to augment organizational performance ((Addaraini, 2020). Due to the high-volume, high-velocity, and high-variety of information assets, which demand cost-effective and innovative forms of information processing and decision-making, operational audits are becoming increasingly more difficult and complex (Gartner, 2016). Modern information technology (Big Data) requires a new skillset from audit professionals as the ability to use and apply existing technology together with new technology can help an auditor carry out inspection task efficiently and effectively reduce the time he or she spends on each audit (Dorgalas et al., 2015). To adjust audit operation in accordance with an ever-changing environment, maintain the audit quality, and achieve the audit goals, auditors thus need to develop their competency (Salijeni, Samsonova-Tadderu, & Turley, 2019). In short, they need to balance the emergence of new technologies with the need to increasingly rely on accounting information system implementation for audit management (Koutoupis & Pappa, 2018).

Today, auditors have no choice but to enhance their knowledge and skills in Big Data techniques and analytics as an essential component of their professional dealings. As Gepp et al. (2018) observed, auditors perceive the need to keep pace with technological trends "not because they necessarily value the analytical power of Big Data, but because their clients do" (p.110). One core competency now critical to professional auditors and the success of the audit process is the ability to apply data analytics to audit engagements. For one, data analytics provide an additional valuable audit data technique to the set of tools traditionally used in the audit process (Kwon, Lee, & Shin, 2014). In a nutshell, data analytics techniques and methods allow audit teams to both analyze client data and identify areas that need further investigation early in the audit process. Auditing professionals can use data analytics to gain more insight into clients' business and offer them insights. Data may be of limited value unless further efforts are made to analyze them for rational decision making, thus highlighting the need for analytics (Omitogun & Al-Adeem, 2019). Data analytics address the communication of complex data to arrive at cogent decisions.

Audit data analytics (ADA) facilitates organizational transparency and efficiency through the storage, procession, and transmission of information (Zawawi, 2018). Audit teams can tailor audit approaches to deliver substantial results by adapting their audit plans. ADA thus affects professional judgement, audit performance, and perceived audit quality. This is precisely why, as an innovative information technology competency, ADA competency is seen as a strategic resource that can ensure ultimate performance superiority and as one of the cornerstones of an auditor's effectiveness. There is evidence that the early stages of adoption and implementation of data analytics can be inefficient. However, as auditors get more familiarized with this tool, it saves them time (Omitogun & Al-Adeem, 2019). This study explores the use of audit data analytics (ADA) in the current audit practice of Thai Certified Public Accountants (CPA). With the world witnessing dramatic advancements in technology and real-time methods of business transactions, the auditing profession is in a critical phase. Today, to succeed as a professional accountant, a vastly different set of skills is required than was necessary just a decade ago. And in the next decade, things are likely to change even faster and more dramatically as the global economy continues to evolve at an ever-quickening pace.

To survive, accountants must focus on areas where they can complement technology and carve out a competitive advantage where the expertise of accountants is uniquely needed (Abu Afifa, Alsufy, & Abdallah, 2020). The accounting profession faces a choice: either master technology or be mastered by technology (Abu et al., 2020). This requires new core competencies emphasizing the use of data analytics. Yet, prior studies on audit engagement suggest that the use of ADA is relatively limited and the use of more "advanced" ADA even more limited (Kwon et al., 2014; Gepp et al., 2018; Chalu & Mzee, 2018). More specifically, this study seeks to investigate how audit learning diversity, comprehensive audit adroitness, audit technological attention, and stakeholder pressure intensity affect certified public accountants' professional audit data analytics competency. This study contributes to a better understanding of the sources of audit data analytics competency among Thai CPAs and provide an opportunity for them to further integrate modern information technology into their auditing practices, thereby increasing the level of public confidence in the profession and preparing them for the future.

2. Literature Review and Research Hypotheses Development

- Professional Audit Data Analytics (ADA) Competency

Audit analytics, or audit data analytics (ADA) refers to the intelligence generated from reviewing audit-related information, often through the use of technology (Yeo & Carter, 2017). Like other types of data analytics, ADA typically involve analyzing large sets of numbers to

find actionable audit insights. ADA can also involve text. The main driver of using data analytics is to improve audit quality (Al-khaddash, Nawas, & Ramadan, 2013). Data remain more meaningful when analytics and technology are used for complex data needs. Thus, ADA competency is the capability of an auditor to provide audit insights using data management, infrastructure, and competency (Al-Tabbaa, Leach, & Khan, 2019). However, organizations must also convert these valuable insights into actions. Generally speaking, ADA competencies of CPAs fall into three broad areas: technical auditing (accounting) expertise, skills relating to critical thinking and business understanding, and interpersonal and communication skills (Schildt, 2017). At its core, data analytics competency illuminates the importance of leveraging management, technology, and talent capabilities (Yeo & Carter, 2017). However, while managers are positive about investing in data analytics competency, when it comes to decision making, they may feel that their intuition is more accurate that the analysis performed on datasets (Hodgkinson & Kealey, 2011). This can be the case even though ADA competency has been found to enhance organizational performance by improving productivity both tangible (i.e., less paper reporting) and intangible (organization reputation) benefits (Wixom, Yen, & Relich, 2013). It has also been proven to be essential to track possible tax infringements and tax offenders (Dorgalas et al., 2015). Thus, many tax authorities are using an audit analytics approach to quickly and effectively reduce the potential for fraud and enhance tax performance (Chalu & Mzee, 2018).

- The four Dimensions of Professional ADA Competency

The dependent variable in this study, ADA competency, consists of four dimensions: audit tactic intellectual, technology innovation adoption, proactive control awareness, and personnel expertise orientation.

(i) Audit Tactic Intellectual:

Audit tactic intellectual refers to the ability of audit data analytics competency to plan, coordinate, control, and manage information resources in accordance with the organization needs in order to achieve it operational goals. The usage of audit tactic intellectual increase operational efficiency by reducing cost. It also helps to quickly identify potential fraud and plays an important role in the sweeping advance of analytics in organization practices (Kalsum, 2021). Agility in audit tactic intellectual for data analytics provides superior value and overcomes disruption risks (Yeo & Carter, 2017).

(ii) Technology Innovation Adoption:

Technology innovation adoption can be defined as the capacity of an information technology infrastructure to quickly develop and support an organization's resources (Gepp et al., 2018). Andiola, Masters, and Norman (2020) determined that technology innovation can be identified as a key predictor of data analytics competency and emphasized the need for versatility of the analytics platform so that it connects data from various functions across the organization, ensures information flow, and enhances the performance of the data analytics platform in terms of connectivity, compatibility and modularity. As a result, technology innovation adoption influences risk management, fraud detection, and audit performance.

(iii) Proactive Control Awareness:

Proactive control awareness involves a careful internal control in order to comply with applicable laws and regulations. It enables auditors to obtain an in-depth understanding of the audit practice and adjust an organizations' operation and long-term survival (Dewu & Barghathi, (2019). An auditor's attempts to increase audit quality leads to positive audit outcomes.

(iv) Personnel Expertise Orientation:
Personnel expertise orientation refers to the ability of analytics professionals to perform assigned tasks in the audit environment through technical skills, relational knowledge, and technological management knowledge. It leads to new challenges in terms of supporting organizational goals (Gupta & George, 2016). Al Frijat (2013) found that the existence of qualified human resources personnel and the application of advanced computer and control systems contribute to enhancing the effectiveness of the information system.

- Audit Learning Diversity
Audit learning diversity refers to an auditor's attitude towards lifelong learning. Much knowledge is acquired through education and training in accounting and auditing programs, communication, interaction with the external environment such as, for example, clients, and conversations with other auditors (Welay, Rosidi, & Nurkholis, 2019). Auditors who have greater audit learning diversity are better able to find out errors from accounting transactions, are more aware of the effect of rules on audit processes, and more capable of discovering fraud (Neely, Gregory, & Platts, 2005). Thus, auditors with different kinds of audit learning are likely to provide greater audit proficiency, commit to auditing standards, and respond to users' expectations very well. In addition, different types of audit learning and experience enable auditors to choose the best way to respond when facing ethical dilemmas. It also helps them raise suspicion as it makes it easier for them to understand faults accurately and find the cause of errors (Syamsuddin et al., 2014). Therefore, the following hypotheses can be articulated:

H1: *The higher the audit-learning diversity, the more likely auditors will gain greater (a) audit tactic intellectual, (b) technology innovation adoption, (c) proactive control awareness, and (d) personnel expertise orientation.*

- Comprehensive Audit Adroitness
Comprehensive audit adroitness can be defined as an auditor's action resulting from the accumulation of a variety of technological knowledge, various direct and indirect experiences, and expertise in the audit task, that transmits into audit differences likely to strengthen specialization (Ghasemaghaei, Ebrahimi, & Hassanein, 2018). Through the process of incorporating new information and integrating knowledge among different audit functions within the audit process, efficiency in terms of audit sustainability increases (Frisk, & Bannister, (2017). Moreover, if auditors learn new topics, rules, and methods; they can apply the newly learned techniques to current situations. Auditors who intend to pursue a career in this field will be willing to work hard to achieve the audit objectives and benefit stakeholders by adhering to the code of conduct and avoiding malfunctions (Mela, Zarefar, & Andreas 2016). The following hypotheses can therefore be proposed:

H2: *The higher the comprehensive audit adroitness, the more likely auditors will gain greater (a) audit tactic intellectual, (b) technology innovation adoption, (c) proactive control awareness, and (d) personnel expertise orientation.*

- Audit Technological Attention
Audit technological attention refers to an auditor's talent to implement the advanced computer-assisted programs/tools/techniques that can automate an aspect of the audit. Such auditors have sufficient knowledge and skills of technology, are aware of the importance of technology and able to utilize technology (Richardson & Watson (2021) to codify the increased role of technology in audit technological skills, reduce audit hours for the task, and greatly increase the reliability of conclusions (Kwon, Lee, & Shin, 2014). Also, the increase in technological attention makes auditors improve their own individual behaviors in order to gain greater quality of audit results. Audit technological attention stimulates the auditor to prepare, develop knowledge, and select suitable technology to benefit auditors. (Jiang, Messier, & Wood, 2020).

Therefore, the following hypotheses can be proposed:

H3: *The higher the audit technological attention, the more likely auditors will gain greater (a) audit tactic intellectual, (b) technology innovation adoption, (c) proactive control awareness, and (d) personnel expertise orientation.*

- Stakeholder Pressure Intensity

Stakeholder pressure intensity is to the degree expectations of the people affected by society, government, and private agencies with an impetus to demand certain actions from audit authorities in terms of the necessity of responding to changes in stakeholder demand and adopting audit analytics technology to better perform audits (Choi, Wallace, & Wang, 2018). Therefore, stakeholder pressure intensity affects audit authorities' judgments by motivating auditor officers to look for evidence that support a stakeholders' preferred outcome. The expectations and pressures from stakeholders will motivate the auditors to perform audit tasks with a high level of knowledge and skills. In addition, pressure from stakeholder forces auditors to pay more attention to ethical principles when performing audit duties (Taddei & Siddiqui, 2016). Thus, the following hypotheses can be proposed:

H4: *The higher the stakeholder pressure intensity, the more likely auditors will gain greater (a) audit tactic intellectual, (b) technology innovation adoption, (c) proactive control awareness, and (d) personnel expertise orientation.*

- Control Variables

Control variables were added to avoid any bias due to demographics, the characteristic of control variables that may influence hypothesized relationships. In this research, organizational size and working experience are the two variables recoded into dummy variables.

- *Organizational Size*: Organizational size refers to the number of employees. Previous research indicates that organizational size is an important factor that affects the application of the information system (Abdel-Kader & Luther, 2008). Larger organization may have more resources than smaller ones (Gupta & George, 2016).

- *Working Experience*: Working experience is measured by the number of years in audit jobs and practice that affects the relationships among audit data analytics competency. Prior research suggests that auditors with more working experience in collective knowledge have skills and capability that lead to increased audit competency (Kaplan, O' Donell, & Arel, 2008). Based on the above, the following conceptual model was developed. The independent variables are audit learning diversity, comprehensive audit adroitness, audit technological attention, and stakeholder pressure intensity.

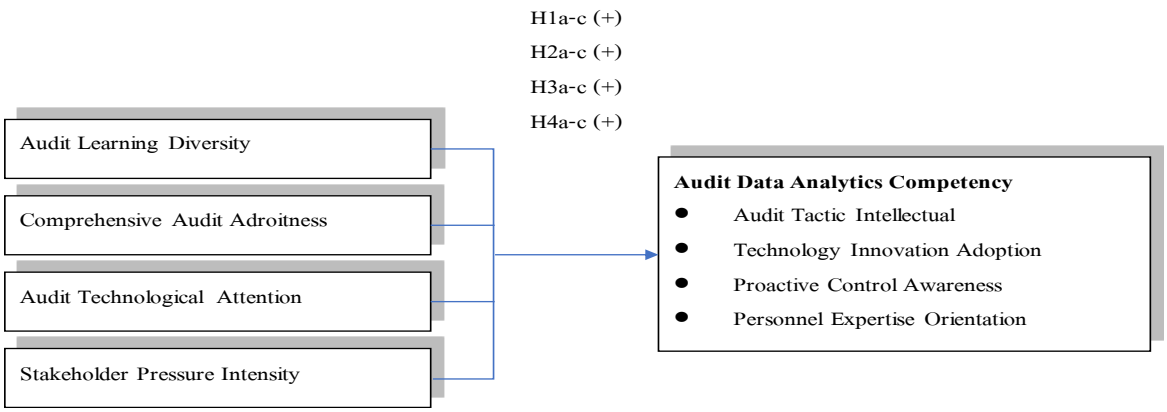

Figure 1: Conceptual Model of the Factors Affecting CPAs' Professional Audit Data Analytics Competency (created by the author for this study)

3. Research Methodology

- *Sample Selection and Data Collection Procedure*

The population consists of certified public accountants in Thailand, selected from the current and reliable online database of the Federation of Accounting Profession under the Royal Patronage of His Majesty the King. This database includes 13,872 active auditors. This information was downloaded on January 15, 2022, from the Federation's database. To calculate the appropriate sample size an equation under the 95% confidentiality rule was used, based on the Krejcie Morgan method (Krejcie & Morgan, 1970). As determined by Aaker, Kumar, and Day (2001), a 20% response rate for a mail survey without an appropriate follow-up procedure, is deemed sufficient. 1,875 (375*5) mailed questionnaires were therefore deemed an appropriate distribution for a mail survey. Since 129 surveys were undeliverable and 26 not completed, the valid mailing amounted to 1,720 surveys. Out of all the surveys sent, 346 responses were received as completed surveys, bringing the effective responses rate to approximately 20.12 percent and therefore in line with Aaker, Kumar, and Day's (2001) recommendation. The non-response bias was tested for generalization based on Armstrong and Overton' (1977) recommendations. The objective was to detect whether there were significant differences in terms of demographic information on the CPAs (gender, age, married status, education level, and audit experience) between early and late responses. The results indicate no significant difference. Therefore, there was no non-response bias.

- *Questionnaire Development and Variable Measurements*

The questionnaire is based on each construct's definition and related literature and was verified by three academic experts and adjusted wherever necessary to ensure that it was effective. Moreover, a pretest was conducted. The validity and reliability of the questionnaire in terms of measurements of the constructs were tested as well. The questionnaire consisted of four parts. Part one focused on personal information about the CPAs. Part two pertained to the rating of the factors stimulating CPAs' behavior and part three CPAs audit data analytics competency. An open-ended question was included in part four. A five-point Likert scale, ranging from 1 = strongly disagree, to 5 = strongly agree, was used to measure the variables (Newell & Goldsmith, 2001).

- *Reliability and Validity*

Since the constructs and multiple scale items in this study were developed from new scales derived from the relevant body of literature, a pre-test method was deemed appropriate to assert the validity and reliability of the questionnaire. The pre-test was conducted with 30 CPAs. As can be seen in Table 1, the factor loadings of each item were between 0.563 and 0.862, which are higher than the 0.40 cut-off point, indicating the construct validity of the questionnaire (Nunnally & Bernstein, 1994). In addition, the Cronbach's alphas were between 0.775 and 0.871, which are higher than the 0.70 cut-off point (Hair et al., 2010). This ensured the validity and reliability of the questionnaire.

Table 1: Results of Factor Loading and Alpha Coefficient of Constructs

Variables	Factor Loadings	Cronbach's Alpha
Audit Tactic Intellectual (ATI)	.836 - .862	.842
Technology Innovation Adoption (TIA)	.773 - .851	.871
Proactive Control Awareness (PCA)	.791 - .826	.845
Personnel Expertise Orientation (PEO)	.725 - .806	.802
Audit Learning Diversity (ALD)	.749 - .787	.836
Comprehensive Audit Adroitness (CAA)	.760 - .779	.775
Audit Technological Attention (ATA)	.563 - .689	.798
Stakeholder Pressure Intensity (SPI)	.624 - .664	.782

- *Statistical Techniques*

The ordinary least squares method (OLS) regression analysis was used for testing the hypotheses and checking normality, heteroscedasticity, autocorrelation, multicollinearity, and linearity. The OLS regression analysis not only explains the relationship between two variables, it also provides a sense of the rationale behind the interaction, which relates to the effect of the independent variables on the dependent variables as a liner function of variables (Jaccard & Turrisi, 2003). An OLS regression analysis was therefore appropriate to test all the hypotheses in this research. The following equations represent the equation models of these relationships:

Equation 1: $ATI = \alpha_1 + \beta_1 ALD + \beta_2 CAA + \beta_3 ATA + \beta_4 SPI + \varepsilon$

Equation 2: $TIA = \alpha_2 + \beta_5 ALD + \beta_6 CAA + \beta_7 ATA + \beta_8 SPI + \varepsilon$

Equation 3: $PCA = \alpha_3 + \beta_9 ALD + \beta_{10} CAA + \beta_{11} ATA + \beta_{12} SPI + \varepsilon$

Equation 4: $PEO = \alpha_4 + \beta_{13} ALD + \beta_{14} CAA + \beta_{15} ATA + \beta_{16} SPI + \varepsilon$

4. Results and Discussion

The demographics characteristics of the 346 participants are presented in Table 2. As can be seen, a major proportion of them are females (81.21%). 48.26 percent of the respondents are 36-40 years old. 54.04 percent of them are single and 79.76 percent have a bachelor's degree. 45.66 percent have 5-10 years' audit experience and 47.98 percent of the participants have an auditor tenure of 5-10 years.

Table 2: Demographics of Key Participants

Description	Categories	Frequencies	Percentage
1. Gender	Male	65	18.79
	Female	281	81.21
	Total	346	100.00
2. Age	Less than 30 years old	25	7.23
	30-35 years old	120	34.68
	36-40 years old	167	48.26
	More than 40 years old	34	9.83
	Total	346	100.00
3. Marital Status	Single	187	54.04
	Married	113	32.66
	Divorced	46	13.30
	Total	346	100.00
4. Educational Level	Bachelor's Degree	276	79.76
	Higher than bachelor's degree	70	20.24
	Total	346	100.00
5. Audit Experience	Less than 5 years	61	17.63
	5-10 years	158	45.66
	11-15 years	72	20.82
	More than 15 years	55	15.89
	Total	346	100.00
6. Length of CPA tenure	Less than 5 years	73	21.10
	5-10 years	166	47.98
	11-15 years	81	23.41
	More than 15 years	26	7.51
	Total	346	100.00

- *Results of Correlation Analysis*

The results indicate that there was no multicollinearity problem. The maximum value of VIFs ranged from 1.359 to 2.952, which is well below the cut-off point of 10 (Hair et al., 2010). In addition, the correlations between each of the variables was less than 0.80 (Hair et al., 2010). In this study, the bivariate correlation procedure was scaled to a two-tailed test of statistical significance at $p<0.01$ and $p<0.05$. The results are shown in Table 3, which also reports the Pearson correlation coefficient of the variables. The findings indicate that the ALD, CAA), ATA), and SPI) were positively correlated with each of the components of professional audit data analytics competency; namely, ATI, TIA, PCA, and PEO. Therefore, the overall antecedents are significance for each dimension of professional audit data analytics competency.

Table 3: Descriptive Statistics and Correlation Matrix

Variables	ATI	TIA	PCA	PEO	ALD	CAA	ATA	SPI	OS	WE
Mean	4.42	4.30	4.10	4.26	4.29	4.11	4.17	3.68	3.89	3.65
S.D.	.498	.540	.679	.586	.607	.528	.562	.543	.438	.552
ATI	1									
TIA	.451**	1								
PCA	.562**	.343**	1							
PEO	.461**	.580**	.608**	1						
ALD	.603**	.669**	.546**	.646**	1					
CAA	.629**	.438**	.615**	.516**	.523**	1				
ATA	.548**	.543**	.525**	.508**	.403**	.423**	1			
SPI	.426**	.617**	.493**	.534**	.634**	.530**	.572**	1		
OS	.435**	.409**	.315**	.357**	.426**	.303**	.358**	.418**	1	
WE	.338**	.328**	.365**	.272**	.314**	.294**	.463**	.259**	.364**	1

*** Correlation is significant at the 0.01 level (2-tailed),
** Correlation is significant at the 0.05 level (2-tailed)

In order to test the hypotheses, a regression analysis was used to test the effects of audit learning diversity, comprehensive audit adroitness, audit technological attention, and stakeholder pressure intensity on each dimension of professional audit data analytics competency. The results are presented in Table 4. Audit learning diversity has a significant positive effect on audit tactic intellectual ($\beta_1= 0.289$, $p< 0.05$), technology innovation adoption ($\beta_5= 0.341$, $p< 0.05$), proactive control awareness ($\beta_9= 0.251$, $p< 0.05$), and personnel expertise orientation ($\beta_{13}= 0.307$, $p< 0.05$). Therefore, hypotheses 1a, 1b, 1c, and 1d are supported. Audit learning diversity means that CPAs have increased their knowledge through prior work reviews, analyzed past events, interpreted new audit issues, and adapted to audit tasks (Welay et al., 2019). The outcomes of audit learning diversity increase auditors' tacit, and explicit knowledge as they can perceive when and how to adapt their knowledge in different and challenging situations (Chalu & Mzee, 2018).

Secondly, comprehensive audit adroitness has a significant positive effect on audit tactic intellectual (β_2= 0.283, p< 0.05), technology innovation adoption (β_6= 0.214, p< 0.05), proactive control awareness (β_{10} 0.212, p< 0.05), and personnel expertise orientation (β_{14}= 0.314, p< 0.05), which means that Hypotheses 2a, 2b, 2c, and 2d are supported. CPAs' professional competency varies with the level of experience of auditors (Frisk & Bannister, 2017). Recall that comprehensive audit adroitness refers to the process of incorporating new information and integrating knowledge among the different audit functions within the audit process that can increase the efficiency of audit sustainability.

Thirdly, audit technological attention has a significant positive influence on technology innovation adoption (β_7 0.346, p< 0.05). Thus, Hypothesis 3b is supported. The results are consistent with Wonglimpiyarat's (2017) study, which indicates that CPAs perceive a change of technology as having positive implications for them and see it as a potential source of gain if they use it in their tasks. Therefore, technology development encourages auditors to enhance their ability to use new technologies and develop audit specialization skills for particular tasks.

Yet, these results also show that audit technological attention does not impact audit tactic intellectual (β_3=0.038, p> 0.05), proactive control awareness (β_{11}=0.021, p> 0.05), and personnel expertise orientation (β_{15}=0.035, p> 0.05). Thus, Hypotheses 3a, 3c and 3d are not supported. Possibly, when CPAs verify a company's statements that have not many transactions and no complexity, there is little incentive for them to use advanced technology. Moreover, the constant advances in the relevant technology may act as disincentive for CPAs to develop their proficiency.

Table 4: Results of OLS Regression Analysis

Independent Variable	**Dependent Variable**			
	Equation 1: Audit Tactic Intellectual (ATI),	**Equation 2: Technology Innovation Adoption (TIA),**	**Equation 3: Proactive Control Awareness (PCA),**	**Equation 4: Personnel Expertise Orientation (PEO)**
Audit Learning Diversity (ALD) H1a-1d	**.289** (.068)**	**.341** (0.69)**	**.251** (.063)**	**.307** (.072)**
Comprehensive Audit Adroitness (CAA) H2a-2d	**0.283** (0.055)**	**0.214** (0.054)**	**0.212** (0.056)**	**0.314** (0.050)**
Audit Technological Attention (ATA) H3a-3d	0.038 (0.071)	**0.346** (0.047)**	0.021 (0.035)	0.035 (0.034)
Stakeholder Pressure Intensity (SPI) H4a-4d	**0.269** (0.084)**	0.064 (0.062)	**0.252** (0.063)**	**0.312** (0.064)**
Control Variables: Organizational size	0.018 (0.105)	0.009 (0.095)	-0.018 (0.096)	0.050 (0.080)
Working Experience	**0.182** (0.089)**	0.081 (0.094)	**0.176** (0.088)**	0.063 (0.083)
Adjusted R^2	0.540	0.591	0.374	0.431
Maximum VIF	2.952	2.209	1.359	1.682

[a] Beta coefficient with standard errors in parenthesis. **p< .05, *p < 0.10

Lastly, Stakeholder pressure intensity has a significant positive influence on audit tactic intellectual (β_4 0.269, $p< 0.05$), proactive control awareness (β_{12} 0.252, $p< 0.05$), and personnel expertise orientation (β_{16} 0.312, $p< 0.05$), but doesn't affect technology innovation adoption (β_8=0.064, $p> 0.05$). Accordingly, hypotheses 4a, 4c and 4d are supported but 4b is not. CPAs who are concerned about stakeholders will try to create value for these stakeholders by satisfying users' expectations. However, this pressure from stakeholders does not compel auditors to use audit technology so long as paper-based work still helps to complete the audit work as scheduled and is perceived to create values for the stakeholders. In the case of stakeholders on which the organization is dependent for its continued survival, the focus should be place on the needs and goals of the organization (Kalsum, 2021).

Regarding the control variables, the results indicate that organizational size has no statistically significant effects on the dependent variables. According to Gupta and George (2016), the new wave of data-driven departments has been completely reshaping the ways of developing big data and data analytics competency and therefore organizational size. However, the second control variable, working experience, has a significant influence on audit tactic intellectual and on proactive control awareness. Kalsum (2021) found that working experience is an important successful indicator of an audit and influences an auditor's effectiveness as it relates to achieving an audit objective, bringing in new customers and retaining existing ones, and trusting those who are involved in the audit task.

The auditing profession has a large and growing volume of reliable information available as big data increases their variety and veracity. CPAs also face an increasing velocity of data, particularly in the contest of real-time information. They will find them especially useful to update traditional substantive, analytical, and controls tests by applying problem-driven data analytic techniques on big data (Titera, 2013). Audit data analytics competency can influence goal achievement, such as risk management efficiency and good practice. It is also widely acknowledged to play a vital role in increasing performance (Li et al., 2018). Schildt (2017), found that data analytics competency can improve organizational performance by improving productivity both in terms tangible benefits (e.g. paperless reporting) and intangible ones (e.g. organizational reputation). Thus, an organization that is capable of creating superior data analytics competency is more likely to be able to maximize performance by facilitating the pervasive of insights gained from its data analytics (Dorgalas et al., 2015).

The results of hypothesis testing reveal that most of the hypotheses are fully supported. This can be interpreted as indicating that executives have become aware of the fact that gaining a sustainable advantage from data analytics is not just about investing big amounts of money or having access to sophisticated technology but is also about possessing data-analytic-related technical managerial skills, the right organizational culture, and intensity of technological management knowledge. Data analytics will enhance measurement processes through new forms of evidence that supports management's audit for transactions. They add value to the audit process (Chalu & Mzee, 2018).

5. Conclusion

This study investigated the effect of antecedents, including audit learning diversity, comprehensive audit adroitness, audit technological attention and stakeholder pressure intensity on each dimension of professional audit data analytics competency. The results indicate that audit learning diversity and comprehensive audit adroitness have a positive significant effect on all dimensions of professional audit data analytics competency. In addition, it was found that stakeholder pressure intensity has a positive significant impact on all the components of professional audit data analytics competency, expect for technology innovation adoption. Besides, audit technological attention has a significant positive influence

on technology innovation adoption. Of particular interest to the executives of audit firms is the positive relationship between audit data analytics competency and audit performance as it pertains to risk management efficiency and good practice. Audit data analytics competency might contribute to the organization's ability to find the right balance between exploiting existing resources and exploring new opportunities, to eventually achieve enhanced organizational performance.

- *Theoretical and Managerial Contributions*

In terms of theoretical contribution, the results indicate that CPAs in Thailand intend to develop audit data analytics competency to meet appropriate information needs and effectively enhance risk management and operational good practice. In addition, the results also suggest that developing audit analytics competency can enhance the performance of the audited organization. This suggests that audit analytics competency can be developed through the synergy of three practices: (i) developing management capability, (ii) acquiring technology competence, and (iii) enhancing personnel expertise. These practices are incorporated into audit data analytics competency and contribute to providing information that explains economic changes, promotes an efficient use of resources, and facilitates the creation or enhancement of organization values.

As to managerial contributions, the results show that although data analytics technologies call for substantial investment in terms of implementation and maintenance, CPAs are aware of audit data analytics' potential value and benefits, both in relation to risk management efficiency and operational value. Considering this, executives would benefit from investing time and resources in creating such a capability, which involves management capability, technology competence, and personnel expertise.

- *Limitations and Suggestion for Future Research*

Since the results indicate that some hypotheses are not statistically significant, auditors should find other ways to emphasize skill training and support sources of new information to increase skills and knowledge, in order to meet audit stability. Moreover, it is suggested that in-depth interviews be conducted in future research as they may provide for greater in-depth validity and reliability of the instruments and enlarge the search for new moderator relationships. Finally, to expand the research contributions and verify the research generalizability, future research is needed to collect data from other auditing professions such as tax auditors, governmental auditor, and co-cooperative auditors or Thai-Listed firms in Thailand.

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