

Toward a Link Between IT Determinants and Their Adoption: Empirical Analysis Based on Practicing Chartered Accountants

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Abstract: The main objective of this study is to investigate the association of information technology (IT) training, IT perceived benefits, and IT benefits with IT adoption among practicing Chartered Accountants (CAs). The study then explained the implications of IT adoption and evaluated the relationship between IT training, IT perceived usefulness, and IT usefulness to practicing accountants. Employing a quantitative approach, a series of questionnaires were culled out by making the necessary adjustments to the available items. A total of 88 qualified CAs practicing in Kerala were analyzed. As part of the data analysis, the study used Structural Equation Modeling–Partial Least Squares (SEM–PLS) software. The results of the study have shown a positive significant relationship between two determinants, namely, IT training and IT perceived usefulness, but IT usefulness has no relationship with IT adoption by practicing CAs. This study added to the literature by analyzing IT determinants and the adoption of auditing software among practicing auditors.

Keywords: IT adoption, IT perceived benefit, IT usefulness, practicing chartered accountants.

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INTRODUCTION

Practical training increases audit assistants' efficiency and effectiveness (Chen et al., 2020). Generally, Big 4 audit firms are relatively acquainted with audit technology than individual audit firms. Big 4 audit firms are hiring freshly qualified auditors having less experience to have higher auditor technology expertise (Deswanto, 2020; Abou-El-Sood et al., 2015). Based on data mining, applied statistics, and Benford's Law to scam detection practical training was leading to reducing the gap between the needs of auditors and software functioning in the future audit (Badal-Valero et al., 2018; Pedrosa et al., 2015). In the Big 4 audit firm, chartered accountants can acquire additional practical audit software training using improved technology, particularly on the new auditing and other compliance requirements (Parsons et al., 2020; Nor et al., 2017). The usage of audit software has a number of advantages over the traditional auditing method (Al-Hiyari et al., 2019; Thottoli, 2020a; Thottoli, 2020b). The traditional audit takes the only sample of data for their audit process to make an audit opinion (Ahmi & Kent, 2013; Flowerday & Von Solms, 2005). Computer Assisted Audit Techniques (CAATs) allow auditors to test and examine a cent percentage of clients' transactions, leading to more comprehensive and substantive



audit procedures (Appelbaum et al., 2017). It is practically proven that the auditors can examine clients' data and transactions using CAATs quickly that have been done after considering risk assessment. Consequently, the auditors reactive to such risks are additional operative and focused (The World Bank, 2017). This is mainly significant as auditors encountered enhanced expectations and workloads from stakeholders associated with the value and scope of the audit. Audit software uses to detect errors and fraud and helps to detect duplicate transactions, missing transactions, and irregularities (Al-Hiyari et al., 2019). The adoption of Information Technologies (IT) in auditing is one of the effective and efficient tools for improving auditing assignments (Pedrosa et al., 2019). To conduct efficient and effective audit procedures, auditors should utilize computer software applications (Al-Hiyari et al., 2019).

Even with the remarkable benefits of using audit software in each audit task (Eilifsen et al., 2020; Elefterie & Badea, 2016), numerous recent studies suggest it is unsatisfactory the use of audit software among practicing auditors (Li et al., 2018; Bierstaker et al., 2014). For instance, KPMG revealed that many auditors could not be able to use records analytics successfully to complete their audit tasks timely, or it has been found that the auditors employ it in an ad-hoc way. Likely, (Dias & Marques, 2018; Ramlukan, 2015) have found that many audit firms and internal auditors aimed to integrate audit analytics during the audit process. At the same time, it is expected that all auditors must have a suitable and adequate level of technological competency (e.g., MS Excel) to assist the audit processes. In the meantime, extant study reconnoitered the IT factors of auditor's adoption of audit software in developed countries (Serpeninova et al., 2020; Handoko et al., 2018; Rosli et al., 2012; Bierstaker et al., 2014; Widuri et al., 2016; Gonzalez et al., 2012). For example, Pedrosa & Costa (2012) opined that a common tool for fraud detection used by internal auditors is CAATs, generalized audit software (GAS), or other customized audit software. (Stoel & Havelka, 2021; Dias & Marques, 2018; Rosli et al., 2012) studied the aspects that affect audit managers' decisions to adopt audit software by a particular audit firm. They showed that the auditor's knowledge, skills, and experience in IT, and they believe the benefit of using such IT to perform the audit tasks effectively and efficiently plays a vivacious role in persuading auditors' intentions to use audit software. Janvrin et al. (2008); Bierstaker et al. (2014) found that to increase audit software usage, managing partners of audit firms may want to give importance to practical training programs to upsurge auditors' degree of skills in using audit software. Cao et al. (2015) opined that partners of audit firms might want to boost their organizational and IT (IT) support for customized audit software to encourage their usage. Researchers from the disciplines of IT have found and suggested the IT usefulness of using audit software used by audit firms (Janvrin et al., 2008). The current study used IT usefulness to identify the factors of IT adoption by auditors. The IT usefulness model is provided by Venkatesh et al. (2003) and developed as a hypothetical basis upon which to study the acceptance and usage of some type of IT (Gonzalez et al., 2012). Knowing the determining factor of adopting IT allows auditors and audit firms to motivate make interventions (e.g., training, marketing, etc.) directed auditors that might be less motivated to adopt IT (Venkatesh et al., 2003).

Advanced use of IT by clients to do their financial tasks, audit standards propose that auditors too adopt CAAT tools (Pedrosa et al., 2020). Garven & Scarlata (2020) examined factors that possibly affect auditors' adoption of IT tools. Examining auditor adoption of audit tools is important because IT audit tools provide promise improvement to audit effectiveness and efficiency (Cristea, 2020; Thottoli & Thomas, 2020). The use of technologies in auditing practice by practicing professionals is an important factor to know the audit efficiency and effectiveness of audit firms (Castka et al., 2020). Auditors must also seek to improve their professional judgment and IT expertise in all instances (Hermawan et al., 2021). To automate audit tasks, auditors use Generalized Audit Software (GAS) (Bradford et al., 2020). IT audit tools aid auditors in analyzing accounting information automatically where it is impractical to do so without technology (Jain & Lamba, 2020). Audit

technologies allow practicing auditors to perform audit work efficiently, and effectively, and also help to reduce audit time (Bradford et al., 2020). To increase the adoption of IT audit, audit firm management wants to encourage audit training programs to increase auditors' ease of using the latest audit tools and techniques (Dagilienė & Klovienė, 2019). Technical infrastructure support and management pressures influence the adoption of IT tools by practicing auditors (Omitogun & Al-Adeem, 2019). IT perceived benefit influences the adoption of IT audit tools by audit firms. The effort expectancy, IT perceived benefit, and the facilitating conditions are the main drivers of adopting and use of IT tools by practicing auditors (Bradford et al., 2020; Dagilienė & Klovienė, 2019). There is not enough evidence that practicing auditors have extensively adopted IT audit tools for auditing the financial statements of the clients (Thottoli et al., 2019a). IT perceived benefit has been promoted the existence of the use of generalized audit software, but auditors do not certainly seem to be attentive to this tool (Bradford et al., 2020). Internal auditors are accepting to use of IT audit tools and techniques in different ways (Alqudah et al., 2019). Individual characteristics of the auditor determine the adoption of audit tools by audit firms (Castka et al., 2020). Thus, the existing study aims to analyze the relationship between IT training, IT perceived benefit, and IT usefulness components with IT adoption by practicing chartered accountants.

METHODS

A quantitative approach was performed with a set of survey questionnaires was formed by getting required adaptations to available items. A structured questionnaire survey as per Hox & Boeije (2005) was applied to gather data on IT adoption by practicing chartered accountants is the key tool for this research. A total of usable 88 respondents' data were obtained from qualified chartered accountants who are practicing in Kerala using simple random sampling. These respondents from several practicing professional auditing firms registered as a sole proprietorship and partnership firms. Despite the poor response rate, it is crucial to remember that the target audience was busy practicing chartered accountants. A non-response bias could be the cause of the low number of responses. The primary data were collected in 2019 for analysis. As part of the data analysis, the research has used Structural Equation Modelling-Partial Least Squares (SEM-PLS) software.

IT adoption was the study's dependent variable. IT adoption is the process by which an audit firm expects that it will accept or adopt IT into its operations. IT adoption entails implementing modern technology in the audit firm which might be in the way of investing in IT-enabled auditing such as customized auditing software. The independent variables of this study are IT training, IT perceived benefit and IT usefulness. IT training imparts an understanding of IT-enabled auditing procedures through both off-the-job and on-the-job training. IT Perceived Benefit describes how practicing auditors perceive the benefits of adopting an IT-enabled auditing technique. IT usefulness refers to the qualities of IT-enabled auditing practice that assist practicing auditors in auditing financial statements.

At the same time, the PLS approach can be used to assess structural path coefficients and measurement model parameters (Chin, 1998). The PLS model can be validated with a smaller number of samples and delivers more consistent results (Barclay et al., 1995). The dependent variables (IT adoption) in the current study can have up to three estimated independent variables. As a consequence, PLS analysis can be performed with the 88 sample size. The bootstrapping procedure has used in this study (Simar & Wilson, 2007).

The survey is conducted based on constructs validated in previous research, adapted, and identical to the framework of this study. For Section A, in total there are 11 demographic questions. Section B assesses IT adoption, Section C provides IT Training, Section D, indicates IT perceived benefits of IT auditing, and Section E, IT usefulness by auditing professionals. This questionnaire is adapted from Thottoli et al. (2019b).

RESULTS AND DISCUSSION

The results of the descriptive statistics show in Table 1 that the dependent variable, IT adoption presents 36% as average and 2.67 as standard deviation. The minimum and maximum ranges are 30% and 45% respectively for IT adoption. Independent variables such as IT training, IT perceived benefit, IT usefulness average 13%, 21%, and 21%; standard deviation 1.33, 2.17, and 4.61; minimum 10%, 15%, and 13%; and maximum 15%, 24%, and 57% respectively.

Table 1 Descriptive Statistics

Variables	Mean (%)	Std. Dev	Minimum (%)	Maximum (%)
IT Adoption	36	2.67	30	45
IT Training	13	1.33	10	15
IT perceived benefit	21	2.17	15	24
IT usefulness	21	4.61	13	57

The discriminant validity of a construct is a measure of how different it is from other constructs (Hair et al., 2010). It is shown by certainly lower correlation among the degree of attention and other items of measures which are purportedly not gaging the similar concept or variable (Heeler & Ray, 1972). There are some standard criteria to be applied to analyze or examine discriminant validity in SEM-PLS. The square root of each construct's AVE should take precedence over the degree of relationships that affect the constructs. Consequently, the square root of the average is equaled in contrast to the relationships of such other constructs (Fornell & Larcker, 1981). As appeared in Table 2, the computed square-root of the average surpasses the intercorrelations of the hypothesis with other hypotheses in the model guarantees satisfactory discriminant validity.

Table 2 Discriminant Validity Constructs

Variables	IT Adoption	IT Training	IT perceived benefit	IT usefulness
IT Adoption	0.417			
IT Training	0.789	0.667		
IT perceived benefit	0.831	0.737	0.571	
IT usefulness	0.510	0.607	0.459	0.527

The structural-model evaluation may perform measurement model has agreed with all the prescribed standards. The determination coefficient (R^2) is the first stage in evaluating the structural model. In this study, the endogenous variable has an R^2 value of 0.753 (substantial), indicating that IT training, IT perceived advantage, and IT usefulness explain 75% of the variance in auditing practice (see Table 3).

Table 3 Variance Explained

Endogenous Construct	Variance Explained (R^2)
Exogenous Variables -> Endogenous (Auditing practice)	0.753

H1, H2, and H3 were hypothesized to affect a positive or negative relationship between IT determinants (IT training, IT perceived benefit, and IT usefulness) and IT adoption, which was tried at the same time via bootstrapping method. The path coefficient range is considered to be acceptable if it is greater than 0.1 points (Henseler et al., 2016). After analysis of the path estimates from the beginning stage, 2 of the variables were shown as significant and 1 has not shown significant. The following is a summary of the test's findings. Table 4 summarizes the hypothesis testing process. It shows that two factors out of three of the independent variables have a positive relationship with IT adoption, (IT training 0.014, IT perceived benefit 0.000) whereas, the remaining independent variable shows a negative association with IT adoption, (IT usefulness 0.381).

The findings revealed that IT training has a significant relationship with IT adoption $P < 0.05$, $t = 2.211$. This result directs that IT training has a significant effect on IT adoption. This has been pointed out that there is a lack of IT training among auditing professionals. Therefore, H1 is supported.

The findings revealed that IT perceived benefit has a positive and significant relationship with IT adoption where it was $P < 0.001$, $t = 4.901$.

This result shows that the IT perceived benefit has a positive impact on IT adoption. This has been pointed out that there is a lack of knowledge of IT perceived benefits among auditing professionals. Therefore, H2 is supported.

The findings revealed that IT usefulness has a negative connection with IT adoption where it was $P < 0.05$, $t = 0.302$. This result shows that IT usefulness has a negative effect on IT adoption. This has been pointed out that there is a lack of factors of IT usefulness among practicing chartered accountants. Therefore, H3 is not supported.

Overall, two findings have positively supported the statement that the most factors do influence IT adoption.

Table 4 Path-Coefficients

Hypotheses	Path	Path Coefficient	Standard Error	t-value
H1	IT_T -> IT_A	0.014	0.165	*2.211
H2	IT_PB -> IT_A	0.000	0.111	***4.901
H3	IT usefulness -> IT_A	0.381	0.129	0.302

Note: Significance levels: *** $p < 0.001$ ($t > 3.33$), ** $p < 0.01$ ($t > 2.33$), * $p < 0.05$ ($t > 1.605$) (based in one-tailed test)

IT training was the first element investigated in this study. Several studies have found that one of the most important variables influencing IT adoption is IT training (Pedrosa et al., 2020; Al-Hiyari et al., 2019; Widuri et al., 2019; Li et al., 2018; Nduati et al., 2015). IT training shows a crucial role to adopt IT by practicing chartered accountants for efficient and effective audit practice. IT adopted audit firms can improve audit efficiency, productivity, effectiveness, and daily operational activities faster (Eulerich et al., 2019; Shamsuddin et al., 2015). Audit software is an effective tool to conduct audit assignments (Kahyaoğlu et al., 2020). IT adopted firms found that they reduce overall audit periods and enhance the reliability of inferences of analysis performed (Mustapha & Lai, 2017; Amin & Mohamed, 2016). Therefore, audit software also helps to practice chartered accountants in the process of giving reasonable assurance (Dbouk & Zaarour, 2017).

Table 4 presents the path coefficient analysis, which reveals a positive association between IT training and IT adoption ($\beta = 0.014$, $p < 0.05$). This has been supported by the hypothesis suggested in the existing study indicating that practicing chartered accountants tempt to adopt IT in their audit firms if the audit assistants get adequate IT training. More precisely, the result shows that there is a substantial +ve connection between IT training and IT adoption. This finding indicates that IT training is a strong determinant for practicing chartered accountants and their audit firms to get a better level of thinking in order to adopt IT by audit firms. The current study found a positive link between IT training and IT adoption, which is consistent with a previous study, Thottoli et al. (2019a) where they realized that there was a significant impact on IT audit control, quality, efficiency, and effectiveness, and internal control risks in auditing practice.

However, the current study's findings revealed that IT training has a significant and positive relationship with IT adoption, this finding may be for several reasons. Firstly, sufficient, and adequate IT training eliminates ambiguity among audit assistants or practicing chartered accountants about the IT tools used in audit software. Secondly, scholars believe that adequate IT training makes auditing work easier than manual ways of doing auditing. Therefore, present practicing-chartered accountants should change to an IT-enabled environment. Thirdly, sufficient, and adequate IT training helps to do auditing faster. This can help practicing chartered accountants to accept more and more clients for audit of their financial statements. When practicing chartered accountants and their audit firms gets adequate knowledge and practical training about audit software / CAAT, it increases their willingness to adopt IT in their firms. Eventually, this reveals a high level of IT training and a higher willingness for IT adoption by practicing chartered accountants. Thus, it can be summarized, that the rational justification for attaining this result for the first hypothesis, is that there is an improved awareness of giving IT training that will increase the willingness of IT adoption by practicing chartered accountants, therefore it acting as a guide to eventually enhance the effectiveness of doing audit by auditing professionals.

The perceived benefit of IT was the second aspect investigated in this study. According to previous research, IT perceived advantages are the most critical elements that drive IT adoption (Idota et al., 2020; Rikhardsson & Dull, 2016; Razi & Madani, 2013; Abiola, 2014; Mihret & Yismaw, 2007). The ICT-enabled financial plan will provide benefits for preparing financial statements (Thottoli, 2021a). Accounting and Audit software is generally used to ease audit tasks to replace the cumbersome manual way of doing an audit to achieve gradual substantial benefit to audit firms. Usage of audit software helps to detect suspicious transactions, address footing ledgers, and generate a confirmation. Besides, audit software allows auditors to test 100 percent of clients' accounting transactions which might be not practical if they do manual auditing. Through audit programs, auditors get a better understanding of the operational activities of their clients as well as ensure professional skepticism (Mohamed et al., 2019; Byrnes et al., 2018). The main IT perceived benefit from audit automation was an increase in audit quality through the financial cost was a barrier to achieving the full potential of audit automation (Katamba et al., 2017). The adoption of audit software in audit firms has several benefits. However, the lack of proper evidence on the use of audit software and its cost-benefit analysis kept back ambiguity to investing in GAS/CAATs. This ambiguity among auditors to continue manual working with the traditional audit process (Mohamed et al., 2019; Pedrosa et al., 2020). The adoption of audit software expects to provide an improved quality of audit work effectively and efficiently, especially in terms of energy and time (Widuri et al., 2019).

Table 4 shows the results of the path coefficient analysis, which reveal a substantial connection between IT perceived benefit and audit adoption ($\beta = 0.000$, $p < 0.001$). This is consistent with the hypothesis proposed in the current study, which states that practicing chartered accountants consider IT perceived benefit when

deciding whether or not to implement IT in their audit firms, since it aids them in doing auditing more efficiently and effectively. In other words, the result shows that there is a substantial positive connection between IT perceived benefit and IT adoption by practicing chartered accountants. This result discloses that the IT perceived benefit enhances a strong element that enables the practicing-chartered accountants as well as audit firms to reach a higher level of their audit practice giving adequate knowledge of IT use and its benefits thereby ensuring fast, accurate, effective, and efficient way of doing auditing. This agrees with the study of Thottoli et al. (2019b); Thottoli (2021b); Thottoli (2020a) who found that audit benefit elements effects accounting and auditing practices among practicing chartered accountants. Similarly, this result is consistent with Tarek et al. (2017), who opined that the use of audit software and adoption of CAATs benefited in many ways and transformed the traditional manual audit process to acquaint technology-based audit practice. The positive finding can be due to various reasons. First, IT auditing among practicing chartered accountants ultimately reduces audit costs. Second, IT auditing increases audit assistants' and practicing chartered accountants' performance. Third, IT-adopted audit firms can accept more audit clients thereby IT auditing increases the firm's profitability. Fourth, since audit does by computer system helps IT adopted audit firms to complete audit tasks on time. Fifth, IT auditing improves audit work accuracy. The IT perceived benefit leads to the adoption of audit software, which allows audit firms to accept a large number of clients. As a result, audit firms should move away from manual auditing and toward an IT-enabled environment.

The results for the third factor, IT usefulness, demonstrate a negative relationship between IT usefulness and IT adoption. This result shows that the level of IT usefulness determinants has no effect on IT adoption. The study proposes that there is a positive relationship with IT adoption has not in line with this result, which shows a substantial direction ($t = 0.302$, $P < 0.05$).

Widuri et al. (2017) Agency Theory and TAM express that academic involvement not only in IT but also in auditing, meaning that not all respondents agreed that audit software is helping them in examining items in the financial report. Al-Hiyari et al., (2019); Mansour (2016) stated that CAATs might help to firm's facilitating conditions and auditor's performance expectancy. This result is not in accordance with the objectives set in the current study. The research cannot affect IT usefulness factors and in IT adoption by practicing chartered accountants.

CONCLUSION

This study attempts to acquire knowledge of IT determinants of ICT-enabled audit tools and their adoption among practicing auditors. This study enriches existing literature with a new discussion that includes IT adoption which affects by IT training, IT perceived benefit, and factors of IT usefulness by practicing audit firms, which is unique as compared to earlier studies. This research enlightens the importance of IT training and IT perceived benefit on IT adoption to adopt IT-enabled audit software. The results revealed that the possibility of adopting IT-enabled audit software by small audit firms in Kerala is high. Ultimately, the results of the study confirmed that two components of the IT determinants (IT training and IT perceived benefits) on the adoption of IT-enabled audit tools affect significantly whereas factors of IT usefulness have no relationship with IT adoption. The findings of the study enrich accounting literature in the field of IT adoption. This study improves the knowledge among junior auditors about IT adoption in auditing practice. Especially, sole proprietorship auditors may think to implement IT auditing tools for auditing items of financial statements. This may assist the Institute of Chartered Accountants of India (ICAI) to amend the audit regulatory framework to move toward IT-enabled auditing practice. It guides internal and statutory auditors to use IT-enabled audit tools. Audit

software developers may also help this study to develop customized audit software for sole proprietorship audit firms to increase their operational efficiency. Thus, these IT determinants and IT adoption will enhance the audit practice among small-scale audit firms. IT-enabled audit practice ultimately satisfies the interest of shareholders, investors, and clients. Further, this study may assist statutory regulators and policymakers in general, ICAI, the association of audit firms, and the government to set timely and deliberate policies related to awareness of IT-enabled audit practice among practicing chartered accountants. This study has limited to a particular geographical area, Kerala, only. Further, the study has considered only limited variables such as IT training, IT perceived benefit and IT usefulness which affect IT adoption by practicing chartered accountants. Future studies can be extended to large-sized audit firms both in Kerala or other parts of the world.

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