

Key Determinants of Internal Auditors' Usage of Computer Assisted Audit Techniques in Sri Lanka

¹Pathmasiri B.

¹School of Accounting and Business, The Institute of Chartered Accountants of Sri Lanka

²Piyananda D.

²Department of Finance, Faculty of Commerce and Management Studies, University of Kelaniya

¹bawanthapathmasiri@gmail.com, ²dhanushkap@kln.ac.lk

Abstract

At present global business environment is challenged through the rapid pace of technological advancement. Thus, internal auditors are also experiencing with the challenging working environment as most of the functions of the organizations are extensively getting computerized. Auditors are in the view that Computer Assisted Audit Techniques (CAATs) may increase the efficiency and effectiveness of their work. However, recent studies shown that there is a less tendency among auditors (specially the internal auditors) to use CAATs. Thus, this study aims to identify the significant variables affecting to CAATs usage level among internal auditors in Sri Lanka. Further, the study aims to assess the extent to which those variables are affect the CAATs adoption by internal auditors. Important constructs were identified referring to the Unified Theory of Acceptance and Use of Technology (UTAUT) model which is a well-known theoretical model developed in information system field. Data were collected from 75 auditors from both Big 4 and local audit firms who are engaging with the internal auditing of corporations. Data analysis was conducted through descriptive statistics, correlation analysis and multiple regression analysis. Results indicate that Performance Expectancy, Effort Expectancy, Facilitating Conditions and Social Influence have significant positive impact. The results suggest that audit firms shall create a supportive environment while establishing proper policies, investing more on management and technical infrastructures and thereby drive the CAATs usage intention of auditors.

Keywords: *Computer Assisted Audit Techniques, Unified Theory of Acceptance and Use of Technology, Performance Expectancy, Facilitating Conditions, Social Influence, Effort Expectancy*

Introduction

At present, with the increased level of digitalization, many organizations where an audit is performed are in a computerized setting that causes new possibilities and new risks for the auditors' work. The rising difficulty of Enterprise Resource Planning (ERP) systems and the huge number of transactions recorded in the accounting systems demanded a fast replacement of "manual" audit techniques with "computer-assisted techniques" which are usually recognized as Computer Assisted Audit Techniques (CAATs). In Sri Lanka, many efforts have been exerted by auditing professional bodies. Accordingly, CAATs usage for audit field works were permitted and encouraged through Auditing Standards as CAATs enable auditors to evaluate the controls through extracting and examining relevant data. Further, as many corporations have shifted from manual accounting to computerized accounting practices in Sri Lanka it is crucial for both internal and external auditor to adopt CAATs in order to ensure the integrity of the client's computer-based accounting systems.

Currently, increasing usage of CAATs by the auditor can be seen. The importance in usage of CAATs is that it holds the promise of improving the efficiency and effectiveness of the audit quality. (Zhaol, Yen, & Chang, 2004). For instance, it allows the auditors to test the

entire population rather than testing on a sample basis. The usage of CAATs and business intelligence systems contributes significantly to reducing the time needed to obtain audit evidence as it provides real-time access to audited data. It is evidenced that auditors only use CAATs to pick random test samples, but not to test audit evidence entirely. That is, they often stick to carrying out their audit engagements in accordance with the conventional methods and despite the current importance on the establishments of CAATs. CAATs are generally defined as any use of audit technology to assist in the completion of an audit. There are different types of CAATs which is being used in businesses. For example; Microsoft Excel applications, Power BI, Audit Command Language (ACL), Tableau, and Teammate are few among them.

The evolution of CAATs began in 1950's with the increasing usage of technology in auditing and density is increasing exponentially. The emergence of digital technology into accounting systems changed the way information was processed, obtained, and managed. The first use of a computerized accounting system is thought to have been at General Electric in 1954. The auditors were conduct auditing on the computer during the period from 1954 to the mid-1960s. Only mainframe computers were used at this period and few people had computer programming skills and abilities. This started to change in the mid-1960s with the invention of modern, smaller, and less costly machines. This demand more usage of computers in companies and thereby created the need for auditors to become comfortable with company's Electronic Data Processing (EDP). The rise of various forms of accounting systems has come together with the rise of computer use. As a result, the auditing industry soon realized that their own software had to be developed and the first Generalized Audit Software (GAS) was developed in 1968. Auditing technology refers to any tool that can boost the ability of the auditor to conduct an audit process. GAS is the most popular form of audit technology used in the category of CAATs.

Many theories have been proposed to explain use acceptance of new Technology in the contemporary information system literature. The key goal was to minimize the struggle on the implementation of Information Systems or applications. Several authors (Venkatesh et al, 2003, Davis, 1989, Ajzen et al., 1980) all put together eight original theoretical frameworks of individual technology adoption into a new model with the most important determinants. This study mainly focuses on the Unified Theory of Acceptance and Use of Technology (UTAUT) to pinpoint the factors effect on internal auditors' usage of CAATs which will be explained more in Literature review.

Research Problem

Usage of CAATs by both external and internal auditors is vital as there are various tech savvy business models are being initiating with the increased level of digitalization. With the adoption of CAATs for audit field work Sri Lankan auditors can enhance their efficiency and effectiveness. This is because that public limited companies in Sri Lanka have large volume of transactions with tight deadlines for audit works, the auditor can use CAATs to examine enormous volumes of data in a short time with good accuracy, so the auditor can be more precise on their findings and opinions. On the other hand, CAATs enables audited organization to acquire greater assurance with respect to the quality of the financial information through continuous monitoring, real time testing and validation of company data.

More importantly, CAATs have not been utilized extensively in the developing world (Mahzan and Lymer, 2014; Omonuk & Oni, 2015; Widuri et al., 2016). In Sri Lanka, it is

found that many businesses are moving more towards technology as they do their day-to-day transactions through ERP systems, but many audit firms still follow traditional techniques in performing audit procedures. Auditors stated that they do not use CAATs because the tasks at hand are too complex, appropriate training has not been given and because of their lack of knowledge about CAATs they have not implemented. They supported their inability to use of CAATs arguing it was irrelevant to the nature of testing the financial statement assertions or the extent or quality of computerized internal controls (Janvrin et al., 2008; Bierstaker et al., 2001).

This study specifically focuses of internal auditors as there are various studies that scrutinized the usage of CAATs by external auditors (Ahmi & Kent, 2012; Bierstaker et al., 2014; Braun & Davis, 2003; Curtis & Payne, 2008; Janvrin, Bierstaker, & Lowe, 2008). Further, the importance of application of CAATs by internal auditing is really required in continuously changing environment. The main objective of internal audit division of an organization is to establish a systematic approach to evaluate the effectiveness of the control and governance environment. In order to achieve this objective in the digital age, internal auditors shall apply sufficient tools and techniques for the data and information available. As internal consultants of the corporations, internal auditors shall divert from the comfortable mindset and shall become more proactive and performance oriented in the highly digitalized environment. Despite the benefits that can be gained through CAATs, usage level of CATTs by internal auditors are still low (Ahmi et al., 2016; Ahmi & Kent, 2013). The primary issue with the majority of internal auditors of Sri Lankan private companies is their inability to use the CAATs system. Also, most of these companies are still in the process of implementing CAATs system or yet to implement. Thus, most of the internal auditors are still familiar with the manual auditing. As a result, establishing a tech savvy auditing environment has become a key challenge for both inhouse internal audit divisions and audit firms despite the fact that auditors shall equip with technical skills in rapidly digitalizing business environment. In this backdrop, identifying the factors that stimulate internal auditors CAATs adoption intention is really necessary for them to build sound strategies to promote CAATs in their organizational setting. Thus, this study mainly focuses on investigating the factors which stimulate internal auditors to use the CAATs for their work.

Accordingly, the objectives of the study are as follows.

1. To identify the significant factors that effect on internal auditors CAATs adoption intention Sri Lanka.
2. To find out the impact of selected constructs on CAATs adoption intention of internal auditors in Sri Lanka.

This study attempts to provide better understanding of the factors affecting to CAATs adoption intention of internal auditors of Sri Lanka. The findings of the study may guide to both practitioners and regulators of Sri Lanka. CAATs enable organization to enhance the quality of their financial statements as they are effective means of detecting misstatements of financial statements. More importantly, in terms of internal auditing CAATs enable to access the effectiveness of organization risk management, governance and internal control processes. Hence, firms can utilize significant factors identified in this study to encourage the acceptance and usage of such techniques and as a result, increasing in likelihood of detecting frauds and errors in financial reporting. Further, the study results, helpful for

practicing firms to create a technology driven culture in their organizational setting through identifying the significant aspects to be developed in house. For example, by investing more resources in technical infrastructure, by improving auditors' skills through increased CAATs training programmes, and by developing reward systems that encourage auditors to use CAATs.

Literature Survey

Computer Assisted Audit Techniques

CAATs are being increasingly used by both internal and external auditors for their filed works in order to assess the risk of computer-based accounting systems of their clients. (Lowe & Bierstaker, 2009). Thus, in a computerized business environment, auditor can widely apply CAATs to perform their test of controls and substantive testing tasks. Thus, CAATs can be identified as the audit tools which support in efficiency and effectiveness of audit work by automating manual audit activities (Braun & Davis, 2003; Curtis & Payne, 2008). Wide range of CAATs applications with respect to audit profession is evidenced in global context from basic spread sheet and statistical analysis software to more advanced and specialized databases and business intelligence audit software such as, Generalized Audit Software (GAS). As digitalized approach of performing audit tasks CAATs enable auditors to reduce audit cost incurred and improve audit quality and productivity. As a result, CAATs help audit firms to meet the client's expectations with fast audit result and reliable audit procedure.

Under the COVID 19 pandemic, there is a necessity of conducting audits while maintaining social distancing. Thus, auditors can shift from manual auditing to computerized auditing as this allow auditor to access client's data stored in the computer system without physically visiting the client. Auditor also can perform audit investigations through accessing the computerized systems even in the absence of client. However, CAATs adaptation among auditors are still at low level. Mahzan and Lymer (2009), investigated that even though auditors are well aware of the potential benefits of CAATs they are not adopting due to the lack of confidence in using CAATs. This is because that they make technical errors while using CAATs as they are lack with required technical competencies. Braun and Davis (2003), also confirmed this fact while identifying the lack of confidence on CAATs among government auditors to use Audit Command Language (ACL).

Usage of CAATs for Internal Audit in Sri Lanka

Sri Lanka as a developing country is experiencing an aggressive readiness in accepting digitally driven business environment. Accordingly, existing companies are increasing focusing on e-Business, implementation of computerized accounting systems. Further, in order to make the financial reporting function inline with this rapid pace of technology advancement professional accounting and auditing institutions are also in the process of developing legal framework and committing to International Standards on Auditing (ISAs) and International Financial Reporting Standards (IFRS). However, there are many companies yet to implement CAATs. Thus, usage of CAATs for internal auditing in Sri Lanka is becoming more popular in Sri Lanka.

Technology Acceptance Models in Information System Field

The Technology Acceptance Model (TAM), Theory of Reasoned Action (TRA), Theory of Planned Behavior (TPB), the motivational model (MM), Innovation Diffusion Theory (IDT), Model of Personal Computer Utilization (MPCU), the Social Cognitive Theory (SCT) and a model that incorporates TAM and TPB are the eight different models examined, contrasted, and evaluated in information system field. The analysis and comparison conducted by Venkatesh et al., (2003), found that there are some drawbacks of these extant models. Thus, they developed the UTAUT model in while addressing the drawbacks of extant models. The UTAUT model states that there are four factors that influence the individual usage of technology applications including Performance Expectancy (PE), Effort Expectancy (EE), Social Influence (SI) and Facilitating Conditions (FC). Venkatesh et al., (2003), grouped the different variables from eight different models stated and formed these four categories of major constructs. Since all these above factors illustrate the nature of actual CAATs usage decisions in internal audit settings, UTAUT model is seemed to be more relevant to achieve the objectives of this study. Therefore, UTAUT model was applied in this study as the theoretical model to fill the empirical gap as to what variables influence the use of CAATs by internal auditors in Sri Lanka. Because UTAUT is the only model which focuses on organizational level, whereas the other similar models focused only on individual level.

Performance Expectancy (PE)

PE refers to the degree to which an individual believes that using the tool will help to better attain significant rewards in job performance (Venkatesh et al., 2003). Through application of CAATs in their work setting auditors can examine 100% transaction rather depend their opinion only on a sample. CAATs allow internal auditors to gather and analyze large volume of transactions quickly (KPMG,2015), also enable auditor to more focus on high-risk areas and thereby help to improve the efficiency and effectiveness of the audit. Therefore, in general CAATs can be considered as a vital tools support auditors' work.

Effort Expectancy (EE)

EE refers to the degree of ease associated with the use of the tool (Venkatesh et al., 2003). This indicate that EE refers to the effort required to use the system, whether it is simple or difficult. Auditors, particularly those with substantial IT training, may feel at ease using CAATs. Shifting from conventional approach to automated processes adds some complexities to auditors' work (Pedrosa & Costa, 2012). To adopt into CAATs auditor shall improve their IT skills to become practiced to apply these automated tools. Hence, increase internal auditor's EE for CAATs adoption (Al-Hiyari et al, 2019).

Social Influence (SI)

SI is defined as the degree to which an individual perceives that importance that others (such as relatives, peers, and subordinate) believe he or she should use the new system (Venkatesh et al., 2003). Prior research has proven that social influence has an important influence on user's intention to accept and utilize a technology (Kesharwani & Bisht, 2012; Zuiderwijk et al., 2015). In the context of an internal audit setting, SI comes from the head of internal audit department, audit committee, or other people who may affect the decision of internal auditors on whether to accept and use CAATs or not (Mahzan & Lymer, 2014). Therefore, we expect that the degree to which auditors perceive that their superiors (supervisors,

managers, partners) support CAATs usage may influence the target respondents' acceptance of CAATs.

Facilitating Conditions (FC)

FC are defined as the degree to which an individual believes that an organizational and technical infrastructure exists to support use of the tool (Venkatesh et al., 2003). In an internal audit setting, infrastructure may involve required CAATs resources and computer support provided by the audit firms for their employees such as specialized instruction, support center, hotline, and/or usage guidelines (Thompson et al. 1991).

Factors Influencing the Usage of Computer Assisted Audit Techniques

Several studies examined the purpose of implementing and using CAATs in different countries. For instance, Janvrin et al., (2008), observed usage of CAATs by external auditors both in Big 4 and local firms in the US. Their findings revealed that Performance PE and FC increased the possibility of usage of CAATs by the auditors. Similarly, Ebimobowei et al., (2013), analyzed the factors affecting the acceptance of CAATs by using the UTAUT in audit practice in Nigeria. Their findings showed that the use of CAATs by accounting firms was positively correlated with PE, EE, FC and SI. Al-Hiyari et al., (2019), conducted a study applying UTAUT model in Jordan to investigate the factors influencing CAATs adaptation by auditors and the results found that the PE and FC were significant, but SI and EE were insignificant.

Zhaol et al., (2017), surveyed on the factors that affecting the behavioral intention of CAATs adoption and usage of internal auditors in Bahrain. The findings specified that the PE, SI and FC have a positive effect on behavioral intention towards CAATs adoption, but the EE has an insignificant influence on behavioral intention towards the CAATs adoption. Pedrosa et al., (2019), conducted a study to identify the determinants of acceptance and usage of CAATS in Portugal. The result showed that the perceived usefulness, EE, FC, and the number of auditors as significant variables. Gonzalez et al., (2012), found that the perception of EE by internal auditors was an important predictor of their intentions to use CAATs. Venkatesh et al., (2003), reported that the EE has a major effect on the behavioral intention towards the acceptance and usage of CAATs. According to Venkatesh et al., (2003), individual acceptance of new technology changes on its perceived usefulness and perceived ease of use. The ease of use of the CAATs depends on IT training obtained by the auditor Janvrin et al., (2008). The training programs thus can increase confidence of using the CAATs.

Ebimobowei et al., (2013) and Pedrosa et al., (2019), has found that EE has a positive effect on the behavioral intention and usage of external auditors to adopt CAATs. In contrast, Janvrin et al., (2008); Mahzan & Lymer (2013); Bierstaker et al., (2014); Mansour (2016); Zhaol et al., (2017); Al-Hiyari et al., (2019), found out that EE has a negative impact on the behavioral intention and usage of external auditors towards the adoption of CAATs. Ebimobowei et al., (2013) and Zainol et al., (2017), found and stated that SI has a significant effect on the behavioral intention towards CAATs adoption. In contrast, Janvrin et al., (2009); Mahzan & Lymer (2014); Bierstaker et al., (2014); Mansour (2016); Al-Hiyari et al., (2019); Pedrosa et al., (2019) observed that SI has a negative influence on the behavioral intention towards CAATs adoption.

Tumi (2013), investigated the reasons why auditors in Libya may not make use of the CAATs or continuous auditing, using UTAUT model. The findings demonstrated that the

lack of FC to use CAATs is the reason as to why internal auditors in Libya do not make use of CAATs. The survey carried out by the Institute of Internal Auditors (IIA) of Ireland in 2002 with the participation of 65 respondents discovered that hesitation amongst those overseeing internal audit departments in the UK related to automation development. The main reason mentioned for this was that they perceived the lack of software available in the market. The findings obtained from 181 auditors representing global, regional, and local firms. Lowe (2013) indicated that PE and FC increase the likelihood that auditors will accept CAATs. The results showed that implementing training programs to raise the expectations auditors hold regarding how well CAATs may enhance their performance may increase CAATs usage.

A survey conducted in Malaysia which involved 108 internal auditors' representing companies and audit firms in Malaysia showed that effort expectancy is a significant factor influencing the usage level of CAATs compared to other factors that is PE, SI and FC. The results from the findings indicated that PE, EE, SI, and FC all have positive impacts on the usage level of CAATs in Malaysia and in terms of association, PE showed a significant positive correlation with the usage level of CAATs. Phua, Lau and Chris (2011), stated that the audit firms in Malaysia are facing challenges in CAATs usage due to constraints on resources, which are physical resources, intellectual resources, human resources, financial resources, and organizational resources.

A study conducted in Indonesia about the perception of auditor on usage of CAATs concluded that if the auditor has confidence in the increased of work performance, and supported by the suitable FC, then it will enhance the auditor's intention to use CAATs. However, the UTAUT theory that has been applied in this research is partial UTAUT because the researchers did not use nominal variable such as: gender, age, experience, and voluntariness of use as moderating variables.

The above literature review proposes the hypotheses below:

H₁: There is a significant impact of PE on internal auditors' CAATs usage in Sri Lanka.

H₂: There is a significant impact of EE on internal auditors' CAATs usage in Sri Lanka.

H₃: There is a significant impact of SI on internal auditors' CAATs usage in Sri Lanka.

H₄: There is a significant impact of FC on internal auditors' CAATs usage in Sri Lanka.

Research Methodology

Survey Design, Population and Sample Selection

An online survey was carried out to gather the required data through a structured questionnaire. This method is said to be the most effective means of gathering data from Sri Lankan internal auditors. The population of the study consists of internal audit executives in Sri Lanka. The unit of analysis in this study is internal audit executives in the capacity of managers and supervisors. A total of 100 auditors were contacted via emails and supplied with hyperlink of the survey. From this initial sample 75 valid responses were received from the target respondents. Participants worked for a variety of firms, where 68% of participants were employed by Big 4 firms and (32%) by local firms, the highest education level for a significant majority (72%) was a bachelor's degree. Many of the respondents (63%) were male, aged between 26 to 35 years.

This research is built on the theoretical foundation of the UTAUT technology adoption paradigm. According to the UTAUT, four conceptions operate as determinants of factors that influence the level of usage of CAATs. Accordingly, PE, EE, SI, and FC are used as the determinants of CAATs adoption intention as explained in the figure 01 below. It should be noted that Venkatesh et al., (2003), indicate that age, gender, years of experience and voluntariness of use moderate the effects of independent variables to usage of system. However, this study ignores the moderating effect of those variables as previous scholars found no evidence to support such moderating impact in the study setting. For example, Alhiyari (2019).

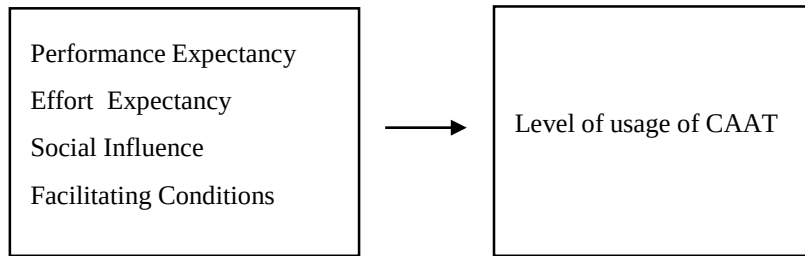


Figure I: Conceptual Framework

This method involved mathematical equation;

$$Y_i = \beta_0 + \beta_1 PE + \beta_2 EE + \beta_3 SI + \beta_4 FC \quad (1)$$

Construct Reliability and Validity

The study questionnaire was created with the goal of producing objective results. Close-ended questions (items) were created as the research instrument based on the study model to ensure that all quantitative data were gathered. Furthermore, these questions were designed with the intended purpose of a few remarks from the participants to be made. This was to support each participants' position on a 1-5 Likert scale where 1 represents "strongly disagree" while 5 represents "strongly agree". A pilot survey was carried out with the participation of five auditors. This was to determine the validity of the data gathering approach. Participants were asked to rate the questionnaire based on the following criteria: clarity and quality of instructions; time to finish the survey; survey flow; and applicability of the questions in relation to the study objectives. Most of the comments and intentions were related to the organization of the questions. (e.g., adding of new items or removing incorrect items), and the phrasing rather than the structure. As a result, a revised version of the questionnaire was created and distributed to the sample participants via Google Forms.

The reliability test determines how bias-free (error-free) the instrument is and so ensures consistent measurement across time and across the various components in the instrument. The reliability of four elements of the questionnaire, including PE, EE, SI, and FC were assessed in this study using Cronbach's Alpha. Sekaran (2003), stated that Cronbach's Alpha is the most common measure of reliability. It varies between zero to one. The closer alpha is to one that indicates the greater internal consistency of items in the questionnaire. According to the recommendation of Bullen (1978), which demonstrates a high level of internal consistency and recommends a minimum level of 0.70. The reliability test results are shown in Table I below. Since the alpha value is greater than 0.7, we can determine that all the variables are acceptable. (Bullen, 1978; George & Mallery, 2003).

Table I: Cronbach's Alpha Results

Factors	No of questions	Cronbach's Alpha
Performance Expectancy	6	0.895
Effort Expectancy	5	0.775
Social Influence	5	0.846
Facilitating Conditions	4	0.793
Level of Usage (Dep. V)	5	0.761

Source: SPSS output

Following the collection of the study's data, data analyses were performed on SPSS 23.0. The data was analyzed using statistical approaches such as descriptive analysis, correlation analysis, and regression analysis. Such various ways of analyses were carried out to make sure that the data collected is reliable and valid for further advanced analysis.

Results

Demographic characteristics of Study Respondents are given below in following Table II.

Table II: Demographic characteristics of Study Respondents

Variable	Values	Frequency	Percent
Gender	Male	47	62.7
	Female	28	37.3
Age	18-25	18	24
	26-30	25	33.3
	31-40	25	33.3
	41<	7	9.4
Educational qualification	Diploma	23	30.7
	Degree	27	36
	Masters	20	26.7
	Beyond masters	5	6.6
Designation	Audit Supervisor	26	35
	Manager	41	55
	Executive internal audit	8	10
Employment	Big 4	51	68
	Local firms	24	32
Experience	1-4 years	35	46.7
	5-9 years	29	38.7
	> 10 years	11	14.7
Types of CAATs use	Microsoft Excel	38	51
	Power BI	14	19
	Teammate	6	8
	ACL	10	13
	Tableau	7	9

Extent of usage of CAATs	To a Small extent	17	22.7
	To some extent	39	52
	To a moderate extent	16	21.3
	To a greater extent	3	4

Source: Survey results

According to table II, higher percentages (62.7 %) of respondents were male auditors while females were only 37.3 %. The sample includes four age groups as: 18-25, 26-30, 31-40 and above 41. Majority of respondents (66.6%) were between 26-40. The educational qualification of respondents was classified into four categories, and out of 75 respondents 30.7% of respondents are Diploma holders, 36% of respondents are degree holders, 26.7% of respondents are masters holders and remaining 6.6 % of respondents are having qualifications beyond masters. Also, it was found that majority of them are also fully and partly qualified with Chartered Accountancy (CA) qualification.

Regarding the designation of the respondents, majority of them are internal audit managers (55%). Out of respondents 26% are audit supervisors and 8% are audit executives. Further, majority of them (46.7%) are having less than 4 years of experience with the internal auditing while 38.7% of respondents are having 5-9 years of experience in internal auditing. Relating to the usage of CAATs, majority of the respondents (51%) are using Microsoft Excel applications for their work. Second highest usage is for Power BI (19%). Further, lesser usage of both Teammate and Tableau is evidenced with the usage rate of 8% and 9% respectively. Survey results indicate that majority of respondents (52%) use CAATs to some extent for their works while only 4% of them applying CAATs at a higher degree for their works.

Extent of adaptation of CAATs by Internal Auditors

The mean value and standard deviation of the variables were taken into consideration in the analysis to find out the extent of usage of CAATs by internal auditors in Sri Lanka.

Table III: Descriptive Statistics

	Mean	Standard Deviation	Skewness	Kurtosis
PE	3.771	0.8716	0.1496	1.986
EE	3.555	0.6932	0.0492	0.875
SI	3.313	0.8451	-0.0175	1.641
FC	3.423	0.7596	-0.4225	1.982
Usage	3.423	0.7116	0.7211	0.783

Source: Survey results

As per the descriptive statistics shown in above table III, mean value of the independent variables according to the responses of the questionnaire, we can see that performance expectancy and effort expectancy have a high mean rate (3.775 and 3.555 respectively) which indicates productivity and job fit plays a big role when it comes to the level of usage of CAATs, and EE indicates that factors such as software training, ease of use, software understanding play a major role. The values for asymmetry and kurtosis between -2 and +2 are considered acceptable in order to prove normal univariate distribution (George & Mallery, 2010) and Hair et al. (2010)) argued that data is considered to be normal if skewness is between -2 to +2 and kurtosis is between -7 to +7. Accordingly, the normality of the data was established in this study.

Correlations Analysis between Variables

Table IV: Correlation Analysis

		Usage	PE	EE	SI	FC
Usage	Pearson Correlation Sig. (2-tailed)	1				
PE	Pearson Correlation Sig. (2-tailed)	0.532** 0.000	1			
EE	Pearson Correlation Sig. (2-tailed)	0.316** 0.000	0.091** 0.000	1		
SI	Pearson Correlation Sig. (2-tailed)	0.616** 0.000	0.412** 0.000	0.312** 0.000	1	
FC	Pearson Correlation Sig. (2-tailed)	0.750** 0.000	0.582** 0.000	0.672** 0.000	0.543** 0.000	1

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

Results of the table IV above indicate: PE had a Correlation value of 0.532 and a p-value of 0.000; EE had a Correlation of 0.316 and a p-value of 0.000; SI had a Correlation of 0.616 and a p-value of 0.000 and FC had a Correlation of 0.75 and a p-value of 0.000. This means that all the variables have positive effects on the CAATs usage by internal auditors. This means that an increase in these variables will cause an increase in the CAATs usage level. The effect was significant as all the p-values were less than 0.05.

Impact of Selected Variables on CAATs Usage Level

Multiple regression was run to assess the impact of selected variables on CAATs usage level. The test results are shown in table 5 and 6 below. According to the table 5 R^2 value is .644 which indicates that 64.4% of variations of CAATs usage level is determined through the selected variables.

Based on the statistics provided in table 6 below the following regression equation is estimated.

$$Y_i = \beta_0 + \beta_1 PE + \beta_2 EE + \beta_3 SI + \beta_4 FC \quad (2)$$

$$Y_i = 1.37 + 0.379PE + .324EE + .334SI + .348FC \quad (3)$$

Hypothesis Testing

H₁: Performance Expectancy has a positive influence on internal auditors' intentions to adopt CAATs in Sri Lanka.

According to the regression analysis, P value for PE is 0.0023, which is below 0.05. Thus, it is rejected the null hypothesis and concluded that there is a significant positive impact of PE on internal auditors' CAATs usage in Sri Lanka.

H₂: Effort Expectancy has a positive influence on internal auditors' intentions to adopt CAATs in Sri Lanka.

According to the regression analysis, P value for EE is 0.003, which is below 0.05. Thus, fails to accept the null hypothesis and concluded that there is a positive impact of EE on internal auditors' CAATs usage in Sri Lanka.

H₃: Social Influence has a positive effect on internal auditors' intentions to adopt CAATs in Sri Lanka

According to the regression analysis, P value for SI is 0.002, which is below 0.05. Thus, fails to accept the null hypothesis and concluded that there is a positive impact of SI on performances on internal auditors' CAATs usage in Sri Lanka.

H₄: Facilitating Conditions have a positive effect on internal auditors' intentions to adopt CAATs in Sri Lanka.

According to the regression analysis, P value for FC is 0.001, which is below 0.05. Thus, it is rejected the null hypothesis and concluded that there is a positive impact of FC on internal auditors' CAATs usage in Sri Lanka.

Table V: Regression Results: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.803 ^a	.644	.620	.3642	1.801

Table VI: Regression Results

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	1.377	.252		5.462	.000		
	PE	.379	.101	.471	3.138	.0023	.280	3.572
	EE	.324	.100	.420	2.910	.003	.268	3.726
	SI	.334	.103	.478	3.241	.002	.287	3.487
	FC	.348	.102	.447	3.418	.001	.364	2.747

Source: SPSS Analysis Results

Discussion and Findings

Findings of the study revealed that Sri Lankan internal auditors are extensively applying Microsoft Excel application as a means of CAATs to improve their work efficiency.

Further, it was revealed both Performance Expectancy and Effort Expectancy are having relatively high impact on CAATs usage level by internal auditors of Sri Lanka. With respect to PE auditors are in the view that using CAATs usually assist them to conduct the audit within the budgeted time and thereby reduce the time spent on conducting test of controls and substantive testing while improving the audit efficiency. With respect to EE, auditors who have sufficient IT training may feel at ease in using CAATs and thereby tend to adopt CAATs.

Impact of Performance Expectancy on CAATs Usage Level

As per the regression result, it was established that PE is having positive impact on CAATs usage level of Sri Lanka. The findings also consistent with the previous studies (Bierstaker et al., (2014); Mahzan & Lymer (2014). Further, Janvrin, Lowe and Bierstaker (2008) found that auditors employed at Big 4 audit firms are more likely to rate PE as a significant determinant of CAATs usage level than those employed by small audit firms. In this study majority of respondents are from Big 4 audit firms and same behaviour from them was observed. This is because that, Big 4 auditors are more likely to audit larger corporations which have established more complex IT platform in house. Thus, auditors tend to adopt

CAATs to enhance the efficiency of their audit field work. Thus, Big 4 auditors can further improve their existing training programme and small auditors can develop training programmes to raise the belief of auditors about the contribution of CAATs in enhancing their job performance.

Usage of CAATs enable auditors spent less time on audit process, they will be able to spend more time on high-risk areas rather considering usual processes. Further, improved programmes embedded in CAATs enable auditors to gather entire population rather performing the audit procedures on sample basis. Given these benefits nowadays auditors are increasingly believing that CAATs enable them to achieve their desired job performance and as a result increasing trend in accepting of CAATs is evidenced.

Impact of Effort Expectancy on CAATs Usage Level

According to the multiple regression, hypothesis of this study shows that there is a significant positive impact of EE on CAATs usage level of Sri Lanka. This is true since auditors tend use CAATs as they believe that CAATs enable them to perform the task effectively and as a result they must spend less effort in conducting audit processes than manual method. These findings are in consistent with the Alhiyari (2019), Curtis & Payne, (2014) and Mahzan & Lymer (2014). The common reason for them to reach at an insignificant result is that their study sample consisted of majority from young internal auditors who have high level of computer literacy. Therefore, internal auditors do not consider about the degree of ease of using the CAATs as unimportant factors when they make their decision. Further, in an auditing context, the effectiveness of audit procedures is given a high priority by internal auditors when making technology usage decisions, and as a result personal preference on effort in using is irrelevant when making the decision (Bierstaker et al., 2014).

However, these findings are not consistent with the findings of Gonzalez et al., (2012). As per Davis (1989), Although an individual perceived that using IT tools make it easy to achieve their desired outcome, they are also in the view that IT tools are very hard to utilize. According to the Pedrosa & Costa (2012), adopting to CAATs has created additional burden over internal auditors as it has created additional complexities on their works. For example, at the beginning they must spend more time and effort in getting required training on the application. However, later when they are working with CAATs they will be able to minimize the complications in their works. Since these burdens are there before accepting a particular application auditor tend to evaluate the degree of easiness and effort-less of using it.

Impact of Social Influence on CAATs Usage Level

This study found that there is a significant positive impact of SI on CAATs usage level of internal auditors in Sri Lanka. This finding is consistent with previous studies of Curtis & Payne (2008); Gonzalez et al., (2012) who found the evidence supporting the notion that SI had a strong effect on the behavioural intentions of internal auditors to adopt CAATs. This simply indicates the pressure from head of internal audit department, audit managers, supervisors, professional bodies, and peers to the auditors' decision on usage of CAATs.

In a situation where auditors are not much familiar with the applications, they expect to share other experience and recommendations from people around them to make the decision. As audit work environment encourage teamwork, auditors are usually make decisions referring to the ideas from their peers. Thus, SI create big impact on usage level

of CAATs. However, these findings are in contrast with the findings of Bierstaker et al., (2014), Curtis & Payne (2014), and Mahzan & Lymer (2014). Accordingly, they found insignificant impact of SI on usage level of CAATs. They argued that in most of the country's usage of CAATs for audit works are still voluntary which makes internal auditor free to perform context specific decisions on adoption.

Impact of Facilitating Conditions on CAATs Usage Level

The study results revealed a significant positive impact of FC on usage level of CAATs in Sri Lanka. These findings also consistent with previous studies by Bierstaker et al., (2014); Mahzan & Lymer (2014) and Alhiyari (2019). When the audit firm create a supportive culture through investing more resources on IT-related audit training, IS systems, providing more support from software providers and providing more support from top managers will encourage auditors to use CAATs for their field works.

Accordingly, firms should invest more on providing required infrastructure to mitigate the barrier of auditors from accepting and utilizing CAATs. Furthermore, developing new policies regarding hiring and promotion of auditors focusing more in enhancing auditor's ability to use data analytics in their day-to-day audit activities also might be helpful to increase the existing level of usage of CAATs.

Conclusion

Regardless of initiatives taken by Auditing professional bodies around the world to promote the CAATs usage level among auditors, to date CAATs have been used to a limited extent. (Dowling, 2009; Dowling & Leech, 2007). Still in Sri Lanka also CAATs usage among both internal and external auditors are limited. Thus, this study aimed at exploring the extent to which Sri Lankan auditors use CAATs for their field work and to identify the significant factors affecting to their usage level. Thus, the finding of the study paves the way to both practitioners and regulators in promoting CAATs usage in the country. Well established theoretical model in information system field, UTAUT model was applied, and data were collected from 75 internal auditors from both Big 4 and local audit firms. Findings revealed that Performance Expectancy, Social Influence and Facilitating Conditions have significant positive impact while Effort Expectancy is having negative impact on CAATs usage level.

When auditors perceived that they shall take more effort in adopting automated tools as special skills are required, they tend to favour traditional methods. Thus, audit firms shall strategically promote CAATs usage among trainees while convincing them more about the easiness offered by the CAATs. Further, they can promote the usage through establishing reward system which persuade trainees to shift from manual methods to CAATs. Further, audit firms shall create an enabling environment through providing basic technical infrastructures and time to time provide training programme to equip trainees with required skills and update them with timely requirements. Further, audit firms can take the advantage of team culture in promoting the CAATs usage as trainees are more preferred to use CAATs when their reference group is using them.

References

- Alhiari, A. (2019). Factors that influence the use of computer assisted audit techniques (CAATs) by internal auditors in Jordan, *Academy of Accounting and Financial Studies Journal*, 23(3)
- Ahmi, A. and Kent, S., (2013). The utilisation of generalized audit software (GAS) by external auditors. *Managerial Auditing Journal*.
- Ahmi, A., Saidin, S.Z. and Abdullah, A., (2014). IT adoption by internal auditors in public sector: A conceptual study. *Procedia-Social and Behavioral Sciences*, 164, pp.591-599.
- Ahmi, A., Saidin, S.Z., Abdullah, A., Che-Ahmad, A. and Ismail, N.A., (2016). State of information technology adoption by internal audit department in Malaysian public sector. *International Journal of Economics and Financial Issues*, 6, p.S7.
- Al-Hiyari, A., Al Said, N. and Hattab, E., (2019). Factors that influence the use of computer assisted audit techniques (CAATs) by internal auditors in Jordan. *Academy of Accounting and Financial Studies Journal*, 23(3), pp.1-15.
- Bierstaker, J., Janvrin, D., & Lowe, D. (2014). What factors influence auditors' use of computer-assisted audit techniques? *Advances In Accounting*, 30(1), 67-74. doi: 10.1016/j.adiac.2013.12.005
- Bierstaker, J.L., Burnaby, P. and Thibodeau, J., (2001). The impact of information technology on the audit process: an assessment of the state of the art and implications for the future. *Managerial Auditing Journal*.
- Bollen, K.A., (1984). Multiple indicators: Internal consistency or no necessary relationship?. *Quality and Quantity*, 18(4), pp.377-385.
- Braun, R.L. and Davis, H.E., (2003). Computer-assisted audit tools and techniques: analysis and perspectives. *Managerial Auditing Journal*.
- Coderre, D., (1997). Broadening the Audit Scope with Computer-Assisted Audit Tools and Techniques. *EDPACS*, 24(8), 1-15. doi: 10.1080/07366989709452298
- Curtis, M.B. and Payne, E.A., (2008). An examination of contextual factors and individual characteristics affecting technology implementation decisions in auditing. *International Journal of Accounting Information Systems*, 9(2), pp.104-121.
- Davis, F., (1989). Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology. *MIS Quarterly*, 13, 319-340. <https://doi.org/10.2307/249008>
- Dikko, M., (2016). Establishing Construct Validity and Reliability: Pilot Testing of a Qualitative Interview for Research in Takaful (Islamic Insurance). *Qualitative Report*, 21(3).
- Ebimobowei, A. and Binaebi, B., (2013). An Examination of the effectiveness of auditing of local government financial reports in Bayelsa State, Nigeria. *Current Research Journal of Social Sciences*, 5(2), pp.45-53.
- Gonzalez, G.C., Sharma, P.N., & Galletta, D.F. (2012). The antecedents of the use of continuous auditing in the internal auditing context. *International Journal of Accounting Information Systems*, 13(3), pp 248-262.
- Gliem, J.A. and Gliem, R.R., (2003). Calculating, interpreting, and reporting Cronbach's alpha reliability coefficient for Likert-type scales. *Midwest Research-to-Practice Conference in Adult, Continuing, and Community Education*.
- Hair, J.F., Celsi, M., Ortinau, D.J. and Bush, R.P., (2010). *Essentials of marketing research* (Vol. 2). New York, NY: McGraw-Hill/Irwin.

- Janvrin, D., Bierstaker, J. and Lowe, D.J., (2008). An examination of audit information technology use and perceived importance. *Accounting horizons*, 22(1), pp.1-21.
- Janvrin, D., Bierstaker, J. and Lowe, D.J., (2009). An investigation of factors influencing the use of computer-related audit procedures. *Journal of Information Systems*, 23(1), pp.97-118.
- Khalil, AL, and Nafti Olfa (2020) "Factors that Influence the Adoption of Computer Assisted Audit Techniques (CAATs) by External Auditors in Yemen." *International Journal of Accounting and Financial Reporting*, vol. 10, no. 2, p. 1. Crossref, doi:10.5296/ijaf.v10i2.16692.
- Kesharwani, A. and Bisht, S.S., (2012). The impact of trust and perceived risk on internet banking adoption in India: An extension of technology acceptance model. *International journal of bank marketing*.
- Mahzan, N., and Lymer, A.,(2008). Adoption of computer assisted audit tools and techniques (CAATTs) by internal auditors: current issues in the UK. In paper presented at BAA Annual Conference 2008 in Blackpool, UK, British Accounting Association, April.
- Mahzan, N., & Lymer, A., (2014). Examining the adoption of computer-assisted audit tools and techniques: Cases of generalized audit software use by internal auditors. *Managerial Auditing Journal*, 29(4), 327-349.
- Omonuk, J. B., & Oni, A. A., (2015) Computer Assisted Audit Techniques and Audit Quality in Developing Countries:Evidence from Nigeria. *Journal of Internet Banking and Commerce*, 20(3), 1
- Pedrosa, I. and Costa, C.J., (2012). Computer assisted audit tools and techniques in real world: CAATT's applications and approaches in context. *International Journal of Computer Information Systems and Industrial Management Applications*, pp.161-168.
- Phua, L.K., Lau, A.H. and Patel, C., (2011). Competitive advantages of audit firms in the era of international financial reporting standards: An analysis using the Resource-Based View of the firm. In 2010 International Conference on E-Business, Management and Economics (Vol. 3, pp. 308-313).
- Hamdan Rasheed Aljamal, T., Effendy bin Janudin, S., & Abdelhakeem, A. (2021). Factors influencing usage of computer assisted audit techniques: evidence from Jordanian private's companies. DOI:10.31559/GJEB2021.10.1.14
- Serpeninova, I., Makarenko, S.A., and Lytvynova, M. (2019). COMPUTER-ASSISTED AUDIT TECHNIQUES: MAIN ADVANTAGES AND DISADVANTAGES. *Visnik Sums'kogo Deržavnogo Universitetu*, no. 3, pp. 53–58. Crossref, doi:10.21272/1817-9215.2019.3-7.
- Siew, E., Rosli, K., and Yeow, P. (2020). Organizational and environmental influences in the adoption of computer-assisted audit tools and techniques (CAATTs) by audit firms in Malaysia. *International Journal of Accounting Information Systems*, 36, 100445. doi: 10.1016/j.accinf.2019.100445
- Thompson, R.L., Higgins, C.A. and Howell, J.M., (1991). Personal computing: Toward a conceptual model of utilization. *MIS quarterly*, pp.125-143.
- Vasile-Daniel, C. (2010). How Financial Auditors use CAATs and Perceive ERP systems. *JEL Classification*, pp490 - 495.
- Venkatesh, V., and Davis, F. D. (2000). A Theoretical Extension of the Technology Acceptance Model: Four Longitudinal Fields Studies. *Management Science*, 46 (2), pp186 - 204.
- Venkatesh, V., Morris, M. G., Davis, G. B., and Davis, F. D. (2003). "User acceptance of information technology: Toward a unified view". *MIS quarterly*, 27(3): 425-478. <https://doi.org/10.2307/30036540>.

Widuri, R., O'Connell, B., and Yapa, P. W., (2016), Adopting generalized audit software: an Indonesian perspective. *Managerial Auditing Journal*, 31(8/9), 821-847.

Zhaol, N., Yen D.C., and Chang I, (2004). Auditing in the e-commerce era. *Information Management & Computer Security* 12 (5): pp389-400.

Zuiderwijk, A., Janssen, M. and Dwivedi, Y.K., 2015. Acceptance and use predictors of open data technologies: Drawing upon the unified theory of acceptance and use of technology. *Government information quarterly*, 32(4), pp.429-440.