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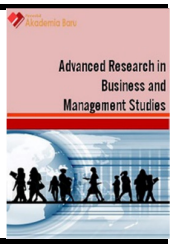

Application of Computer-Assisted Audit Tools and Techniques (CAATTs) in Audit Firms

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ABSTRACT

This paper explores the application of Computer-Assisted Audit Tool and Techniques (CAATTs) and the reasons for the use of CAATTs application among audit firms in Malaysia. The study uses survey and interview methods to explore the types of CAATTs applied by the respondent firms. The results demonstrate that the application of CAATTs among audit firms varies by firm size. The application of advanced CAATTs, i.e. Embedded Audit Modules, Parallel Simulation Software, Test Data were the highest in Big-4 firms, as compared to medium and small sized firms. The reasons that influence them to practice the use of CAATTs are availability of financial resources, partners' expertise and their clients' nature of operation. The application of CAATTs is not compulsory by the law or standards. However, there is an encouragement from the authorities and accounting bodies for the practitioners to apply CAATTs in their audit works. The findings contribute in providing inputs to the policy makers and practitioners on how to enhance the application of CAATTs into the current practice of auditing process and future regulations. The present study also opens up opportunities and provides avenues for more in-depth research on the subject of CAATTs.

Keywords:
CAATTs, Information System Audit, Malaysia

1. Introduction

In today's business organization, the use of information technology (IT) has become an inseparable part of the business and is one of the success factors of a business organization. Professional accountants are now facing new challenges and risks with the use of information technologies. Information systems (IS) are increasingly sophisticated and complex in many business organizations. While the preparation of financial statements by accountants will be easier, the audit works are becoming more complicated and complex; consistent with intricate and complex system used by the business organization. For example, use of Enterprise Resource Planning (ERP) gives a big impact on company's internal control. The ERP changed the way business transactions being collected, processed, disseminated, used and stored. Thus, auditors need to effectively apply Computer-Assisted Audit Tools and Techniques (CAATTs) in their audit works that can assist to read

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transactions and accounting information stored in the ERP system [1] and to ensure that the evidence is correct and has not been altered [2].

Nowadays, the auditing process for business organization that uses fully computerized information system requires external auditor to assess not only the output of the system but also to analyse the software used so that the output of the system will be used for the preparation of the financial statements that can be trusted [2],[3]. Auditors should use online audit software as a means of auditing if the audited system is online and collects audit data electronically [2]. In this computer environment, auditors will no longer perform audit around the computer but use audit software to audit through the computer and gain audit efficiency and effectiveness [2],[4]. Auditing in information systems environment involves audit through the information systems by using data to test the systems. Information systems environment maintains an electronic record about a series of event for business transactions as evidence that the transactions were occurred [5]. The use of computerized systems where there is no paper being used is an evidence that the use of CAATTs is more useful and effective [6]. Therefore, auditors are expected to have appropriate tools and techniques to deliver their audit works in auditing many different clients with diverse information systems. The adequacy of controls in information systems and related operations need to be examined by auditors to ensure systems effectiveness [7]. International Auditing and Assurance Standards Board (IAASB) as issued by an International Standard on Auditing 330 (ISA 330). The Auditor's Responses to Assessed Risks states that the documentation may not be available due to transactions done by computer systems. The audit evidence can only be captured by the use of CAATTs for this situation. Further, ISA 330 states that the use of CAATTs enables the extended testing of data due to the result of risk analysis which may lead to fraud. Besides, CAATTs can also be used for selection and sorting of sample or to test the whole population. Therefore, this study focuses on exploring the application of CAATTs among audit firms in Malaysia.

This paper's objectives are to examine the level and types of CAATTs application and reasons for the application of CAATTs in audit firms.

The organization of this paper is as follows: the next section reviews the existing literature related to the application of CAATTs in auditing. Then, the research methodology will be presented, followed by descriptive and interview findings. Finally, the paper concludes with a discussion of the results, limitation and suggestions for future research.

2. Literature Review

The International Federation of Accountants (IFAC) has stated that "information system consists of infrastructure (physical and hardware components), software, people, procedures, and data. Many information systems make extensive use of information technology" [8]. The rapid growth of technology and the use of information systems in audit practices as business result to assist auditors in their roles and responsibilities. One of the components of information systems auditing is the application of CAATTs. CAATTs is the use of information technology and software that helps the auditor to perform tests of controls and verification, data validation and analysis of financial statements and continuous monitoring of the audit work [1, 9]. CAATTs is a computer software that allows auditors to use the computer in an information system to gather or assist in gathering and analysis of audit evidence [7]. It ranges from a simple audit automation using spreadsheet application to an advanced practice of audit software with databases and business intelligence applications [10, 11].

CAATTs are always used for data analysis, data acquisition, and operational analysis. It can be used in analysis of financial data and error inspections to identify frauds misstatements. Software

that can be used include MS Excel and Access, Audit Command Language (ACL), Interactive Data Extraction and Analysis (IDEA) and active data [9]. ACL or IDEA, is the software can read the data in read-only mode, without changing the original data content. These software's can be used to analyse the financial and operational data and determine the risk items for detailed analysis and tracking, in order for auditors to monitor the high-risk areas.

The increase in the usage of complex computerized information system provides an opportunity for the auditor to obtain audit evidence more effectively and efficiently, for example, interrogation and use test data files can be tested through the use of CAATTs. However, the use of these techniques has its disadvantages as well as the involvement of experts is required, which can be time consuming and expensive, especially in the first year of use. If experts cannot be obtained, the existing staff should be trained to be able to use CAATTs in auditing works, which requires financial and time commitment of the auditors [12]. Standards for Information Systems Auditing (SISA) 040: Competence issued by ISACA [21], for example, requires information systems auditors to be technically qualified; who have the skills and knowledge necessary to perform the work of auditors. It also ensures that the auditor maintains technical skills through continuous training and appropriate education.

The application of CAATTs in audit procedures has an impact on how auditors conduct audits and record the audit work undertaken. CAATTs is increasing its use as a methodology of audit firm to assist auditors in performing their audit procedures. IFAC [22] states CAATTs may improve the efficiency and good quality control processes. However, there is also risk of audit quality with the use of CAATTs. For example, undue emphasis on compliance with CAATTs software and not judge about the unique features of the audited entity; and new staff spend too much time learning how to use the CAATTs software and forget to understand the concept of auditing.

In the Malaysian context, the same standard applies since the Malaysian Institute of Accountants (MIA) has determined to adopt the ISA as the basis for approved standards on auditing. Audit procedures performed in computer information technology environment will not change the overall objectives and scope of audit. The auditor is required to consider the application of CAATTs that use the computer as a tool to carry out audit work in the implementation of audit procedures. The effectiveness and efficiency of auditing procedures can be improved with the use of CAATTs. Effective control testing and substantive procedures on the population and very large sample size can also be held by using CAATTs [14].

MIA clearly states in the International Auditing Practice Statement, page 1, [14], that CAATTs may be used in performing various auditing procedures, such as tests of details of transactions and balances, analytical procedures, tests of general controls, sampling of data for audit testing, tests of application controls, and re-performing calculations.

Reviews of literature indicated that several studies have attempted to investigate the gap between the desired and the actual level of CAATTs practices among auditors. A study conducted in Singapore for the usage of information system tools and techniques found that external auditors use them for limited usage such as for selecting samples to test, substantive test during special investigation and computation to determine materiality and impact on the financial statements [15]. Various information system tools and techniques can be used to assist external auditors in delivering their job but most of them can only perform substantive tests [16]. Therefore, the application of CAATTs in audit works performed by auditors is still comparatively low due to some reasons, for example, costs for the use of CAATTs is not commensurate with the size of their clients or small number of customers they have [12]. This argument raised concern in the perceived value of usage of CAATTs as computer software in helping the auditors do their audit works in information systems environment.

CAATTs may automate previously-manual audit tests, resulting in reduced audit hours for the task and the ability to easily test 100% of the population rather than a sample, greatly increasing the reliability of conclusions based on that test [13]. Other than that, CAATTs shortens the time required for auditing and achieves cost effectiveness. Watne [17] proposed the following factors of the application of CAATTs: reasons for auditors to use computer-assisted auditing (cost, efficiency, audit trail, data processing, etc.), time points for the implementation of CAATTs (processing time and the completion of processing, which depends on the complexity of the system), time points of the CAATTs processing cycle (the implementation of CAATTs at the process stage for internal controls and the implementation of CAATTs after obtaining the processed results, which is collected for evidence testing) [17].

The auditing profession in Malaysia can benefit by identifying relevant technologies and conducting self-assessment to learn how CAATTs software can help their members in delivering their audit works and achieve the level of quality that can be accepted by their clients and auditing standards.

3. Methodology

Data of this study were collected in two approaches. Firstly, a quantitative approach through survey was conducted among 1,367 audit firms registered in the Malaysian Institute of Accountants (MIA). Respondent firms were given a questionnaire which asked them to select types of CAATTs that were applied in performing audit of their clients. The data were captured in percentage of audit tasks performed using the respective CAATTs. Following the survey, a descriptive statistical analysis was employed to examine the data. Secondly, this study used a qualitative approach whereby interviews with selected audit firms were conducted to get an in-depth view pertaining to the application of CAATTs. Interview uses conversation which is physically face to face and helps researchers understand the context and intention of the interviewees [18]. Interview involves gathering information in terms of texts, voices and situations happen in the respondent's life. Targeted respondents may have experience during their life so that the information is embedded in them. This approach is to describe, decode, translate and understand the phenomena or a method to understand better as interpretations and meanings of knowledge [19]. Researchers choose to understand reality from the auditor's perspective and bring their whole self into the matter and this allows the researchers to experience and acknowledge the auditors emotion and feeling which offers richer understanding on the matter under study. The basis for a theoretical explanation of a phenomenon can be understood if studied in sufficient depth and insight, in fact, even an observation is done in a single case [20].

Information is gathered from different categories of audit firms, i.e. big sized audit firms (Big-4 firms), mid-sized audit firms and small sized audit firms. List of audit firms were compiled and selected from MIA Member Firms Directory. This directory consists of active audit firms in Malaysia and is consistently updated. Therefore, all relevant information about audit firms was gathered from this directory. Information is obtained through structured interviews with 5 audit firms located in Kuala Lumpur and Selangor, being selected from the directory, which were identified by the research team as meeting the criteria and having influence in practicing information systems audit in their firms. One Senior Manager, IS Audit Department from one of the big sized of audit firms represents the big sized audit firms group. Two partners from the medium sized audit firms represent medium sized audit firms group. Two partners from the small sized audit firms represent small sized audit firms group.

4. Findings

The survey received a total of 158 usable responses representing the audit firms, which yield a response rate of 11.6 %. Table 1 shows the results of demographic and characteristics of respondent firms. Of the 158 respondents, 4 were from big four firms, followed by 42 respondents from medium sized firm and 112 small sized firms.

RQ 1: What are the types of CAATTs applied in audit firms?

To provide the answer for the first research question, descriptive statistics in Table 2 illustrates the application of CAATTs by audit firms. The types of CAATTs applied by respondents were Audit Automation Software (73.4%) followed by Test Data (37.3%), Database SQL Search (36.1%), Generalize Audit Software (30.4%), Parallel Simulation Software (25.3%) and Embedded Audit Modules (20.9%).

Table 1
Demographics of Respondent

	Frequency	%		Frequency	%
Firm Size			**Services offered**		
Big-4 firms	4	2.5	Financial Auditing	158	100.0
Medium sized firms	42	26.6	IT Auditing	30	19.0
Small sized firms	112	70.9	Internal Auditing	45	25.8
Total	158	100.0	Taxation	142	89.9
			Financial Advisory	93	58.9
			Business Advisory	72	45.6

Table 2
Application of CAATTs

CAATTs	**Small sized firms**		**Medium sized firms**		**Big-4 firms**		**Total**	
	Freq	**%**	**Freq**	**%**	**Freq**	**%**	**Freq**	**%**
Spreadsheets	112	100.0	42	100.0	4	100.0	158	100.0
Audit Automation Software	70	62.5	42	100.0	4	100.0	116	73.4
Generalized Audit Software	21	18.8	23	54.8	4	100.0	48	30.4
Test Data	31	27.7	25	59.5	3	75.0	59	37.3
Database SQL Search	28	25.0	26	61.9	3	75.0	57	36.1
Embedded Audit Modules	14	12.5	18	42.9	1	25.0	33	20.9
Parallel Simulation Software	18	16.1	19	45.2	3	75.0	40	25.3

Freq = Frequency

The results demonstrate that the application of CAATTs among audit firms varies by firm size. The application of advanced CAATTs, i.e. Embedded Audit Modules, Parallel Simulation Software, Test Data were the highest in Big-4 firms, as compared to medium and small sized firms.

All Big-4 firms employed Generalized Audit Software and 75% of them used Test data, Database SDQ Search and Parallel Simulation Software. However, these CAATTs were employed by less than

62% of responded medium sized firms and not more than 27.7% of the small sized audit firms. Specifically, only 54.8% of medium sized firms responded that they employed Generalized Audit Software in auditing, while only 18.8% of respondents who used the software were from small audit firms. More than half of the total respondents from small sized audit firms merely applied spreadsheets and audit automation software to audit their clients.

Further, interviews provide various results in the CAATTs applied in selected audit firms in Malaysia depending on the size of the firms. It was found that for Generalized Audit Software, the Big-4 audit firms use Interactive Data Extraction and Analysis (IDEA) or Audit Command Language (ACL) for data analysis purposes.

Big sized audit firms also use their own developed software to support their staff need in delivering the tasks. As an example, a respondent, one of the big four audit firms uses ACL as a tool to do client's data analysis and a software named SCRIPT to check an internal control of SAP systems (a brand of ERP system). SCRIPT is a software developed by a software development team based in the firm headquarter, United States of America and is distributed to all the firm's operation offices around the world.

Medium sized firm's use various software's in their daily works depending on where the partners get their training and experience. One of our respondents is a partner of medium sized firm that has been trained by the big size audit firm which uses IDEA as the tool to check on data integrity by running a client's data analysis. Therefore, his company also uses IDEA as the tool to do the client's data analysis. Since he is already exposed with the use of the IDEA software, he found that the software is easy and very user friendly. Another respondent from another medium sized audit firm does not use IDEA or ACL software in his audit works. He uses a software called Pro Fx Audit Suite produced by Commerce Clearing House (CCH) Company for audit engagement requirements. This software can produce audit working papers, plans and programs. This software covers a management of audit works for the firm. The firm is still using MS Excel in data analysis and sampling to support their audit works.

Two of our respondents represent the small sized audit firm group. They do not use any of the above software's in their audit works except the Microsoft Word for writing reports and Microsoft Excel for assisting them in analysing accounting data of their clients.

RQ 2: What are the reasons for the application of CAATTs in audit firms?

Based on the feedback of our respondents, the big sized audit firms get the support from their headquarters in form of financial and expertise. They can support regional and branch offices by purchasing or developing a software that can be used by all branches and at the same time gets economic of scale due to more users for a software being purchased or developed. They also have their own resources to train their staff to familiarize with and be an expert of the software. There are no problems for the big audit firms to apply CAATTs in their audit works.

The results for medium sized audit firms are mixed due to different experiences and capabilities of partners and financial resources of each firm. One of our respondents uses IDEA to do an analysis works of the data of his clients due to his experiences using IDEA software during works with one of big sized audit firms. He is using IDEA software when he starts his own audit firm. His experiences and financial resources are the main reasons for the firm to use the IDEA software in audit works. Other reason is whether the client is using an accounting software or not. If client uses an accounting software, the audit firm also need to use the CAATTs software to audit through the computer, otherwise the firm only audit the output from the system if they do not use the CAATTs during the audit sessions. If client does not use any accounting software, the audit firm also does not use the CAATTs software.

Another medium sized audit firm does not use IDEA, ACL or other CAATTs software due to lack of experience in using CAATTs and financial strength of the firm. Although clients use an accounting software in their business operation, the firm only checks on system output due to the above reasons.

The result for the small sized audit firms is about the same, they are not using the CAATTs software. The main reason is their clients do not use the accounting software and the use of CAATTs software is not required in their audit works. If their clients are using an accounting software, there is a small accounting software which does not require the small audit firms to use CAATTs in their audit works. If they want to use the CAATTs software in assisting them, the cost of training and maintenance does not cover the benefit of implementation. A Microsoft Excel software is enough to do the analysis of data due to the size of database is so small. Small sized audit firms also do not have enough financial strength to install the CAATTs software. The comparison between costs versus benefits is negative. It means that the costs of implementation of CAATTs are more than the benefits they get. Finally, the firms also do not have enough time to recover the costs until the new version of CAATTs software will be announced.

5. Conclusion

This study aims to achieve two main objectives. First, it attempts to examine the level and types of CAATTs application in audit firms. The findings indicate that various CAATTs software were applied in audit firms depending on the size of the firms. Big sized audit firms applied established software's such as IDEA and ACL while the result for medium sized audit firms is mixed. One of medium sized audit firms is using an IDEA software but another firm is not using such software. Small sized audit firms do not use any specific CAATTs software.

Second, this study attempts to identify the reasons for the application of CAATTs in audit firms. The findings indicate that big sized audit firm are able to use CAATTs software because they get the support from their headquarters in form of financial resources and expertise. However, the reasons for the application of CAATTs software among the medium sized audit firms are mixed due to different experiences and capabilities of partners and financial resources of each firm. Similarly, findings for the small sized audit firm's show that the main reason they are not using CAATTs software is due to their clients do not use the accounting software and the use of CAATTs software is not required. If they want to use CAATTs software, the cost of implementation does not cover the benefit of implementation.

As a conclusion, the application of CAATTs software among audit firms may depend on the availability of financial resources, partners' expertise and their clients' nature of operation. The findings of this study would initiate discussion, debate and action that will lead to positive changes in the Malaysian auditing profession as it moves forward in today's computerized business environment. It is hoped that the findings will help not only the practitioner but also academicians to focus on the development on necessary information technology skills of accounting graduates. There are two limitations for this study. First, the method of data collection used in this study is limited to survey and interview only and the number of respondents are small. Second, the scope is limited to audit firms only and to a specific regional area. This may not provide the whole truth regarding the application of CAATTs in Malaysia and generalization may not be done. It is suggested that future research should study the application of CAATTs among different level of companies and also public organizations in Malaysia.

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