

## FACTORS INFLUENCING USAGE LEVEL OF COMPUTER ASSISTED AUDIT TECHNIQUES (CAATs) BY INTERNAL AUDITORS IN MALAYSIA

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### ABSTRACT

The main objective of this study is to examine the factors that influence the usage level of Computer Assisted Audit Techniques (CAATs) by internal auditors in Malaysia. The study is vital since CAATs hold out the promise of improving audit efficiency and effectiveness. Data were collected via survey questionnaire on 108 internal auditors that are working in companies and audit firms in Malaysia. Statistical tests such as descriptive analysis, reliability and normality tests as well as Spearman Rho were carried out. The results indicated that effort expectancy is the most influencing factor that affects the usage level of CAATs by internal auditors in Malaysia as compared to other factors such as performance expectancy, social influence and facilitating conditions. The findings revealed that CAATs were favoured by internal auditors since they are easily understandable, have all the necessary functions and capabilities in facilitating their tasks. Finally, the results would encourage the companies and audit firm management to implement and support the usage of CAATs by the internal auditors in their organisation in the future.

**Keywords:** Internal auditors, Computer Assisted Audit Techniques (CAATs), Malaysia

## **1.0 INTRODUCTION**

Information technology (IT) in the business world had grown exponentially in the past two decades; the extent to which auditors have responded in kind remains an empirical question. Computer Assisted Audit Techniques (CAATs) were tools and techniques employed by auditors to extract and analyze client data. CAATs hold the promise of enhanced audit effectiveness and efficiency (Kotb & Roberts, 2011). In order to meet the challenges of rapid advances in client technology, audit standards urge internal auditors to use CAATs within the audit profession. CAATs used the computer as an audit tool for enhancing the effectiveness and efficiency of audit procedures (Isabel Pedrosa, 2012). CAATs also acted as the audit technology that internal and external auditors use in auditing an organization's information system (Lowe & Bierstaker, 2009). Moreover, CAATs were essential tools in auditing profession to achieve audit's test of controls and substantive testing tasks. The audit tools support in efficiency and effectiveness of audit work is automating manual audit activities (Curtis & Payne, 2008). CAATs proposes that four factors influence user acceptance that were the user expectations about system's performance (Performance Expectancy), user's perceptions about the effort needed to use the new system (Effort Expectancy), user's perceptions important to them encourage system used (Social Influence), and user's expectations regarding the existence of an organizational and technical infrastructure to support system used (Facilitating Conditions). From this four factor, we want to know how these factors influence the usage level of CAATs among Internal Auditors in Malaysia.

## **2.0 BACKGROUND OF STUDY**

Many internal auditors used traditional approach, which was manually, in their works (Giselle Bou-Raad, 2012). The usage of the CAATs among auditors was still questionable (Mahzan & Verankutty, 2011). In another situation, Debreceeny (2005) reports that external auditors in Singapore also did not adopt CAATs extensively. They defended their non-use of CAATs by arguing that it was inapplicable to the nature of testing the financial statement assertions or the extent or quality of computerized internal controls (Debreceeny, 2005). In addition, the level of CAATs usage among auditors was still unsatisfied (James Bierstaker, 2013). Due to some reasons, some auditors still doubt on using CAATs.

This research attempts to fill the gap of the lack of research about the factors influence the usage of CAATs among internal auditors. Thus, the main objective of this study is to find out the factors that influence the usage of CAATs among the internal auditors in Malaysia. There were many studies related to usage of CAATs. To illustrate, a previous study by an auditor (Mahzan & Lymer, 2009 and Janvrin, 2009). A survey among auditors discovered that auditors lack confidence in using CAATs although they were aware of the potential benefits because they are lacking in the technical competencies and face technical problems. Reviews of literatures indicate that there are several factors that influence the usage of CAATs by auditors, particularly the internal auditors. The four main factors that influence internal auditor usage levels of CAATs are Performance expectancy, Effort expectancy, Social influence and Facilitating conditions.

## **3.0 LITERATURE REVIEW**

### **3.1 What is CAATs?**

CAATs were the audit technology that internal and external auditors use in auditing an organization's information system (Lowe & Bierstaker, 2009). CAATs were essential tools in auditing profession to achieve audit's test of controls and substantive testing tasks. The audit tools support in efficiency and effectiveness of audit work by automating manual audit activities (Braun & Davis, 2003; Curtis & Payne, 2008). CAATs also were defined as "any use of technology to assist in the completion of an audit". It can be referred from basic spread sheet and statistical analysis software used in audit work to a more advanced and specialized databases and business intelligence audit software applications such as Generalized Audit Software (GAS). CAATs also comprise of tools and techniques that are used to extract, analyse and review logic of processed data. CAATs can reduce audit cost incurred and improve audit quality and productivity. Additionally, CAATs help audit firms to satisfy client's demand for fast audit result and reliable audit procedure.

### **3.2 Usage and Benefits of CAATs**

CAATs allow the auditor to independently access the data stored on a computer system without dependence on the client, test the reliability of client software, increase the accuracy of audit tests and perform audit tests more efficiently which in the long-term will result in a more cost effective audit. CAATs also allow the auditor to save the time. In

many instances, by replacing manual testing procedures with CAATs-based procedures, auditor can save hours or even days on every audit. For example, rather than picking a sample of 25 invoices, and spending a day trawling through paperwork to agree them to purchase orders and payments (3 way matching), you can use CAATs Join 2 Sheets, and in a matter of seconds identify every single invoice that does not have an associated purchase order or goods receipt.

There were many studies related to CAATs usage by individual auditor (Mahzan & Lymer, 2009; Janvrin et al., 2009). A survey among auditors discovered that auditors are lack confidence in using CAATs although they are aware of the potential benefits. They lack the technical competencies and face technical problems. Mahzan and Lymer (2009) studied the motivational factors of CAATs adoption among internal auditors in Malaysia. They measured auditor's performance expectancy, effect expectancy, social influence and facilitating conditions factors. It was found that the four factors significantly influence usage of CAATs. Nonetheless, the result could not be generalized due to small sample size.

### **3.3 Usage of CAATs across the world**

During the past 40 years, the problem of "Individual Information Technology Acceptance" was studied and models were proposed to study this reality. The main aim was to mitigate resistance on Information Systems or applications adoption. Several authors (Venkatesh et al, 2003) put all together on a new model with the most relevant determinants from eight original models and theories of individual technology acceptance. All the studies analyze or propose new determinants tests and inclusion in specific groups. In this paper, we have focus on model revision, on specific studies concerning the model and its adoption in CAATs and internal auditor's acceptance.

CAATs improved audit efficiency by allowing auditors to perform previous manual intensive tasks quickly and efficiently (Zhao et al. 2004). Furthermore, CAATs improve audit effectiveness by enabling auditors to select sample transactions meeting specific criteria, obtain additional information about control effectiveness, and test 100 percent of populations (Braun and Davis, 2003; AICPA, 2006). Prior CAATs research was generally descriptive in nature. Braun and Davis (2003) surveyed governmental auditors regarding their usage of Audit Command Language (ACL), commercially available CAATs. They found that while participants perceived the potential benefits associated with ACL, they displayed a lower confidence in their technical abilities used ACL (Braun and Davis, 2003). Shaikh (2005) suggested a new CAAT based on the electronic auditing framework that includes most features of existing generalized audit software but can be designed and deployed independently from the auditee's EDP system. Finally, (Zhao et al. 2004) described how CAATs must exist in order to conduct continuous auditing. Previous studies have been conducted into CAATs development and application by both internal and external auditors that will form the basis for this research. Systematic review of even basic information of usage does not exist outside the USA. In the UK/Ireland the IIA conducted their first survey touching on CAATs usage at the end of 2002.

The respondents to the survey were 65 heads of Internal Audit from organisations throughout the UK. This survey revealed hesitation amongst those overseeing internal audit departments in the UK related to automation development. The key reason cited for this was that they perceived there was a lack of software available in the market that met their 6 needs as internal auditors. The survey suggested that some software packages were too 'cramping' in their requirements to be directly applicable to working audit methodologies in the businesses that evaluated them – requiring too big a change in the methodologies used to justify the costs for the benefits to be accrued. However, more than 40% of respondents suggested that they would be willing to adopt an amended audit approach if they could find a package, or packages, that otherwise met their needs. This suggests scope for wider automation to occur in the future if the right conditions for their adoption could be understood, and communicated to software developers. Neither of these previous sets of surveys has addressed in any practically useful detail the early stages of CAATs adoption processes, particularly the specific motivations for initially exploring and building a business case for adoption of CAATs, and the limiting factors to wider adoption. Very few studies investigate CAATs adoption among audit firms (Janvrin et al., 2008; Bierstaker et al., 2001). It is important to examine organizations perspective on CAATs because audit firms will ultimately decide on CAATs investment and provide the organizational and technical infrastructure for individual auditors to adopt CAATs successfully. Therefore, both individual and organizations adoption factors were important.

### **3.4 Usage of CAATs among Internal Auditors**

Internal auditors have reviewed and consolidated existing information systems research theoretical frameworks that earlier researchers had obtained for to explain information technology usage and adoption. This study opted as it

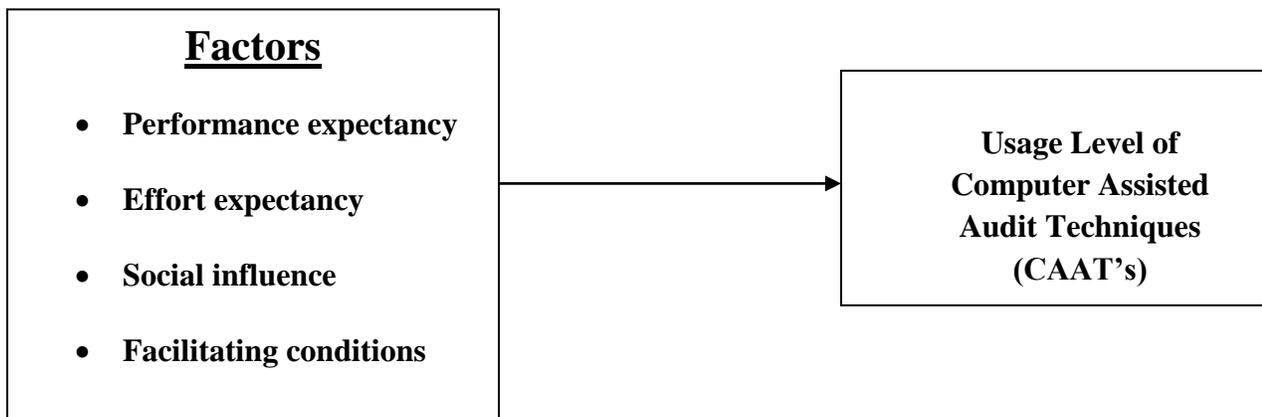
incorporate the constructs of outstanding information systems theories that were empirically tested and validated by information systems researchers to forecast the usage and adoption of technology.

Furthermore, CAATs based result indicated that this new framework's explanation strength for technology acceptance behaviour is up to 70%, which was more valuable than any known technology acceptance and usage prediction models (Venkatesh, 2009). In this study, the CAATs was slightly modified. The present study model contained one dependent variable that was Intentions of use an adoption CAATs. The model contained four independent variables namely Performance expectancy, Effort expectancy, Facilitating conditions and Social influence. The following section discusses the research model and its variables.

### 3.5 Conceptual Research Model

From the above preceding discussions, this study proposed a generic conceptualised framework for factors influencing the usage level of CAATs by internal auditors. The conceptualised framework is presented in Figure 1 below:

Figure 1: Conceptual Framework



Performance expectancy can be defined as the extents to which an individual believes that using the system can aid in attain gains in job performance. As literature, utilisation of CAATs can reveal efficiency and productivity on an information systems audit as compared to the old traditional audit approach (Jaksic, 2009; Saygili, 2010). As a result, information systems auditors might reflect positive intentions towards usage and adoption of CAATs within their audit engagements if they believe that the adoption of CAATs might enhance their audit productivity, the quality of work, and if they believe that this audit technique fits very well within their audit engagements.

#### 2.8.2 Effort Expectancy

Effort expectancy can be defined as the extent of ease associated with the use of the system. The complexity and ease of new technological system usage might have negative influence to the adoption of new audit technology by information systems auditors. As a result, information systems auditor have been equipped with relevant training to ensure that they do not experience any difficulties regarding the use and adoption of CAATs within their audit engagements (Aguolu, 2009). Audit software also highlighted that other than the actual features available within CAATs, the most important factor to the adoption of this audit technique is the ease of use.

#### 2.8.3 Social Influence

These constructs contains the explicit or implicit notion that the individual's behaviour is influenced by the way in which they believe others will view them as a result of having used the technology. As literature, organisational line managers respond more positively to problems and opportunities that are quantified. Furthermore, CAATs enables information systems auditors to quantify their audit evidence on issues gathered during their audit execution. Social influence might also have the positive impact towards the use and adoption of technology.

## 2.8.4 Facilitating Conditions

Facilitating conditions were defined as the degree to which an individual believes that an organizational and technical infrastructure exists to support the usage of the system. The availability of data analytics tools or CAATs infrastructure within the organisation may influence auditor's usage behaviour. Therefore, facilitating conditions was a strong predictor of auditor's behaviour and attitude toward audit technology.

## 4.0 RESEARCH METHODS

### 4.1 Population and Sampling

The study was using a random sampling in getting the samples. The researchers were able to collect the 108 questionnaires from five public-listed companies (PLCs) and two audit firms in Klang Valley. The list of the PLCs and audit firms are listed in Table 1 below:

**Table 1: List of Respondents**

| Public-listed Company/<br>Audit Firm | Number (percentage) of<br>Respondents |
|--------------------------------------|---------------------------------------|
| TNB                                  | 38 (35.2%)                            |
| TANCO                                | 13 (12.03)                            |
| IJM                                  | 18(16.67)                             |
| ANANTHAN ASSOCIATES                  | 5 (4.63)                              |
| ACR                                  | 19 (17.6)                             |
| WANG-ZENG CORPORATION                | 8 (7.41)                              |
| TEK SENG HOLDINGS                    | 7 (6.48)                              |
| <b>Total (7)</b>                     | <b>108 (100%)</b>                     |

### 4.2 Data Collection Procedures

The data for the study have been derived from questionnaire survey. The questionnaire was design to determine the factors that influencing internal auditor's usage level of CAATs. A questionnaire was designed to elicit responses from the respondents regarding their views on the factors. This questionnaire survey method was used to collect data because it was the most commonly used method for collecting information quickly and cheaply (Sekaran and Bougie, 2010). The questionnaire has been created by our own according to the research objective. We have distributed the questionnaire survey by ourselves and personally administered in order to ensure greater and speedier responses as well as able to answer to any inquiries personally.

### 4.3 Measurement of Variables

There were two main variables used in this study that were the independent variables (IV) and dependent variables (DV). In this research, the IV consists of factors that influence the usage of CAATs. The IV is categorized into the following factors: performance expectancy, effort expectancy, social influence and facilitating conditions. Meanwhile, the DV was the usage level of the CAATs among internal auditors in Malaysia.

### 4.4 Data Analysis

Data collected from the survey have been prepared for analyses by completing several preliminary steps before testing the hypotheses. The data have been analyzed using SPSS version 21.0. Various analyses have been carried out to ensure that the data were reliable and valid for further advanced analysis. From statistical analysis view, data analyses have been carried out after collecting the data of the study. The study utilised statistical techniques such as descriptive analysis and correlation analysis in order to analyze the data. The research have applied descriptive statistics which consists of methods for organizing, displaying and describing data by using tables, graphs and summary measures. The purpose of utilising descriptive statistics was to make sure the accuracy of data entry process by evaluating all the research variables that have been entered into the data. In addition, it offers a set of powerful conceptual tools which

one would be able to use in order to extend an understanding of data in a number of important ways. This study used descriptive statistic in order to describe the demographic profiles of respondents as well as other independent and dependent variables.

This research has applied the correlation analysis that aims to determine the relationship between two variables which are the influencing factors (independent variables) and usage level of CAATs (dependent variable). It also has indicated the strength (high or low) and direction (positive or negative) of the relationship.

## 5.0 FINDINGS AND DISCUSSION

### 5.1 Reliability Results

The reliability test is a measure indicates the extent to which it is without bias (error free) and hence ensure consistent measurement across time and across the various items in the instruments (Sekaran and Bougie, 2010). In this study, reliability was tested on four parts of the questionnaire, namely Performance Expectancy, Effort Expectancy, Social Influence, and Facilitating Conditions. Table 2 presents the reliability test results.

Table 2: Reliability Results

| Factors                 | Number Of Questions | Cronbach's Alpha | Result (Based on the Nunally, 1980) |
|-------------------------|---------------------|------------------|-------------------------------------|
| Performance Expectancy  | 6                   | 0.920            | Good                                |
| Effort Expectancy       | 6                   | 0.931            | Good                                |
| Social Influence        | 5                   | 0.871            | Good                                |
| Facilitating Conditions | 6                   | 0.911            | Good                                |

Based on the results, further analysis could be carried out for all the variables – Performance Expectancy, Effort Expectancy, Social Influence, and Facilitating Conditions - since the alpha value is more than 0.7 which is acceptable (Nunnally, 1980; George & Mallery, 2003).

### 5.2 Correlation and Findings

This section discusses the results for the correlation analyses derived from the study. This study employed the Spearman Rho statistical test (non-parametric statistical tests) in order to find out the correlation among the variables since the data were not normally distributed. The Spearman Rho statistical test was used in order to determine the relationship between factors influencing the usage level of Computer Assisted Audit Techniques (CAATs) by the internal auditors in Malaysia. This study is using Pallant's rules of thumb in explaining the correlation results (Pallant, 2001):

- i. 0.7 and above – **very strong relationship**
- ii. 0.50 to 0.69 – **strong relationship**
- iii. 0.30 to 0.49 – **moderate relationship**
- iv. 0.10 to 0.29 – **low relationship**
- v. 0.01 to 0.09 – **very low relationship**

Table 3 below shows that there is a significant relationship between *performance expectancy* and usage level of CAATs in Malaysia. There was strong relationship between two variables,  $r=0.546$ ,  $p\text{-value} < 0.05$  whereby the performance expectancy was positively associated with the usage level of CAATs in Malaysia. The result also indicates that there is a significant relationship between *effort expectancy* and usage level of CAATs in Malaysia. There was strong correlation between two variables,  $r=0.585$ ,  $p\text{-value} < 0.05$ .

In terms of *social influence*, result from Table 3 shows that there is a significant relationship between social influence and usage level of CAATs in Malaysia. However, the relationship was at moderate level with  $r=0.422$ ,  $p\text{-value} < 0.05$ . Meanwhile, Table 3 below also shows that there is a significant relationship between *facilitating conditions* and usage level of CAATs in Malaysia. There was strong correlation between two variables,  $r=0.552$ ,  $p\text{-value} < 0.05$  with was facilitating conditions positively associated with the usage level of CAATs in Malaysia.

Based on the results discussed above, all of the factors have positive significant relationship with the level of usage of CAATs. Among the four factors, the most influential factor that affects the usage level of CAATs is effort expectancy with the coefficient correlation of 0.585 (strong relationship). The least influential factor is the social influence factor with coefficient correlation of 0.442 (moderate relationship).

As for the relationship between the factors, the results indicated that the strongest correlation is between the performance expectancy and effort expectancy with coefficient correlation of 0.775 (very strong relationship). The weakest correlation is between the performance expectancy and social influence with coefficient correlation of 0.453 (moderate relationship).

### Correlations

|                   |                                    |                         | Total Perf.<br>Expectency | Total<br>Effort<br>Expectency | Total<br>Social<br>Influence | Total<br>Facilitating<br>Condition | Total<br>Usage |
|-------------------|------------------------------------|-------------------------|---------------------------|-------------------------------|------------------------------|------------------------------------|----------------|
| Spearman's<br>rho | Total Perf.<br>Expectency          | Correlation Coefficient | 1.000                     | .775**                        | .453**                       | .593**                             | .546**         |
|                   |                                    | Sig. (2-tailed)         | .                         | .000                          | .000                         | .000                               | .000           |
|                   |                                    | N                       | 108                       | 108                           | 108                          | 108                                | 108            |
|                   | Total Effort<br>Expectency         | Correlation Coefficient | .775**                    | 1.000                         | .639**                       | .683**                             | .585**         |
|                   |                                    | Sig. (2-tailed)         | .000                      | .                             | .000                         | .000                               | .000           |
|                   | N                                  | 108                     | 108                       | 108                           | 108                          | 108                                |                |
|                   | Total Social<br>Influence          | Correlation Coefficient | .453**                    | .639**                        | 1.000                        | .566**                             | .422**         |
|                   |                                    | Sig. (2-tailed)         | .000                      | .000                          | .                            | .000                               | .000           |
|                   |                                    | N                       | 108                       | 108                           | 108                          | 108                                | 108            |
|                   | Total<br>Facilitating<br>Condition | Correlation Coefficient | .593**                    | .683**                        | .566**                       | 1.000                              | .552**         |
|                   |                                    | Sig. (2-tailed)         | .000                      | .000                          | .000                         | .                                  | .000           |
|                   |                                    | N                       | 108                       | 108                           | 108                          | 108                                | 108            |
|                   | Total Usage                        | Correlation Coefficient | .546**                    | .585**                        | .422**                       | .552**                             | 1.000          |
|                   |                                    | Sig. (2-tailed)         | .000                      | .000                          | .000                         | .000                               | .              |
|                   |                                    | N                       | 108                       | 108                           | 108                          | 108                                | 108            |

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

**Table 3: Correlation results**

### 5.3 Comparisons with Previous Studies

Based on previous study by James Bierstaker, Diane Janvrin, D. Jordan Lowe, (2013), the results obtained from 181 auditors representing Big 4, national, regional, and local firms indicate that performance expectancy and facilitating conditions increase the likelihood that auditors will accept CAATs. Other prior research suggests that training can be more effectively designed and targeted to particular user groups if the mechanisms of user acceptance are better understood (Bedard, 2003). The findings indicate that developing training programs to increase the expectations auditors hold regarding how well CAATs may improve their performance may increase CAATs usage. These programs may be particularly useful since in general, the participants assigned low importance ratings to CAATs. Furthermore, the results may encourage audit firm management to invest in additional organizational and technical infrastructure supporting CAATs, particularly for auditors that are less inclined to adopt new systems.

On the other hand, our result is obtained from 108 internal auditors' representing companies and audit firms in Malaysia indicate that effort expectancy is most influencing factor the usage level of CAATs compare to other factors that is performance expectancy, social influence and facilitating conditions. The finding indicate that CAATs' interactions are

understandable, have all the functions and capabilities and learning to operate. It should be easy and makes the CAATs most favour to use by internal auditors to conduct their tasks. Finally, the result may encourage the companies and audit firm management to implement and support the usage of CAATs by the internal auditors in future.

## **6.0 CONCLUSION**

The results from the analyses showed that performance expectancy, effort expectancy, social influence, and facilitating conditions have positive impacts on the usage level of CAATs in Malaysia. Based on the results, it showed that these factors influence the usage level of CAATs in Malaysia. The findings, therefore, indicated the four important factors that influence the usage level of CAATs by the internal auditors in Malaysia. In terms of correlation, performance expectancy showed a significant positive association with the usage level of CAATs. This means that the higher the performance expectancy, the higher the usage level of CAATs by the internal auditors. The result indicated that the internal auditors would use CAATs in order to accomplish their tasks more quickly, increase the quality and productivity of their work efficiently. As for the effort expectancy, the results showed a significant positive relationship with the usage level of CAATs. It means that the higher the effort expectancy, the higher the usage level of CAATs by the internal auditors. The findings indicated that the internal auditors would be able to improve their communication better by using CAATs since CAATs have all the necessary functions and capabilities. Furthermore, CAATs were easy to operate.

The results from the study also indicated that social influence showed a positive significant association with the usage level of CAATs. This means that the higher the Social Influence, the higher the usage level of CAATs among the internal auditors. The internal auditors would use CAATs because they were influenced by their co-workers or senior management as well as the current developments in technology and adoptions of new technology by the organization. In terms of facilitating conditions, the results also showed a positive significant association with the usage level of CAATs. This would indicate that the higher the facilitating conditions the higher the usage level of CAATs in Malaysia. The finding indicated that internal auditors would use CAATs since they are good and make their work more interesting.

As a conclusion, this study showed that performance expectancy, effort expectancy, social influence, and facilitating conditions influence the usage level of CAATs by the internal auditors in Malaysia.

## **7.0 LIMITATIONS AND FUTURE RESEARCH**

In completing this study, there were some limitations encountered. Firstly, the time period to carry out the research was rather short. The most time consuming was on data collection and data analysis. The second limitation that was encountered by our group was the difficulties of getting the appointment with internal auditors. This was because they were very busy with their tasks. The third limitation was that some of the internal auditors that we met were not frequently using CAATs. Thus, it was difficult to gather proper information on CAATs.

For this study, it is recommended that the future researchers may choose more samples of internal auditors in order to get a better view. Secondly, future researchers may use this framework in other to carry out similar research pertaining to the usage level of CAATs in Malaysia. In addition, future researchers may also collect data via interviews and they could also ask about the advantages and disadvantages of using CAATs. By conducting interviews, the researchers could gather more information on the usage of CAATs in internal auditors' daily work.

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