

## Computer Assisted Audit Tools and Techniques Adoption: A Systematic Literature Review

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### ABSTRACT

Computer Assisted Audit Techniques and Tools (CAATs) are a form of innovation in the field of technology in the world of accounting, CAATs have become fundamental in many audit methodologies. However, there is still very little information regarding these CAATs. This research is based on increasing knowledge about the success of CAATs, this is useful for analyzing implementation and operational problems with a broader understanding of the practices contained in internal audit departments that use CAATs technology. Therefore, we present a systematic literature review on the factors that determine an auditee to use CAATs technology. This research was conducted using a qualitative analysis of the things that influence an audit to use CAATs in the auditing process based on previous studies. The findings from this study indicate that what influences an audit to use CAATs is time efficiency, work effectiveness, auditor confidence, company partners, processing accuracy, techniques and services, purchase costs, understanding of using CAATs, background of the audit itself, motivation to learning, performance expectations, characteristics of the audit team, support or coercion, and facilities.

### Keywords

CAATs; audits; computers; GAS

## INTRODUCTION

With the development of information technology that has affected the work environment of an organization, there has been a transition from a manual administrative system to an electronic one so that it indirectly requires auditors to use appropriate audit techniques, so that organizations really need to consider innovation in auditing due to a shift in data sources. The physical environment is becoming digital and there are more and more information technology applications involved in organizational business processes.

These developments also penetrated into the field of information, and various aspects of organizational activities, including organizations engaged in the service sector, namely Public Accounting Firms. In utilizing the information system the auditor uses *Computer Assisted Audit Techniques*, which is the use of a computer device program to carry out the audit function so as to simplify the audit process (Romney & Steinbart, 2018). Use *Computer Assisted Audit Techniques* is one of the skills needed considering that in an examination environment that already uses information technology.

CAATs are computer software and techniques used by auditors to perform audit procedures to process data contained in information systems (Singleton, 2003). Recent research shows that the types of CAATs support work such as fraud detection, information retrieval and analysis, audit reporting, reviewing databases of audit history, computer-based training, online buying and selling, creating electronic paperwork and supporting internet and data security. The use of CAATT is not something new in the world of auditing, but has undergone several changes in accordance with developments in the world of auditing. Expansion of the

use of modern processing technology that is profitable in terms of economy, and globally opens up market competition that makes technological evolution change the market which also affects the audit automation process. Moreover, the study aims to find out: (1) What are the factors that cause an auditor or company not to want to adopt CAATs? and (2) What are the factors that make an auditor or company want to adopt CAATs?

## METHODS

A systematic literature review is a clear procedure and can set up a series of phases that can assist the researcher in defining research objectives and planning how resources will be retrieved and reported. This study has followed a series of steps to provide a systemic, transparent, and reproducible methodology are; (1) planning the review: in this phase the research questions are defined and a search protocol is determined, (2) revision development: in this phase, the defined protocol is applied and the main articles are obtained according to the set criteria, and (3) results review: in this phase, we present the search results and analysis of the selected studies. This analysis is explained in the analysis section.

### Development the Review

In the first step, keywords and their respective descriptions are used to search for the main article in the specified sources. Search sources were obtained from publishers: Elsevier, Emerald Group Publishing, Inderscience Enterprises Ltd, American Accounting Association, Association for Computing Machinery, John Wiley and Sons Ltd, IEEE Publishing, David Publishing, Little Lion Scientific, Springer International Publishing, IJSTR Publishing, Allied Academies, Springer Science and Business Media, Springer London, Growing Science Publishing. The research sample range starts in 2001-2022, because in that year there have been many studies on the factors that influence an audit using CAATs.

In particular, the search was limited to high quality journals on the keywords Computer Audit, CAAT, CAATT and GAS by considering the available journal editions from the 2001-2022 period, as many as 51 potential papers had been identified, this was carried out by a selection process according to established criteria.

## RESULTS

The results of the selection of articles resulted in 51 articles. Only four studies which constituted a Systematic Literature Review, the other 47 which were surveys, interviews, comparative, case studies, conceptual studies, and field studies, were analyzed to answer the research questions.

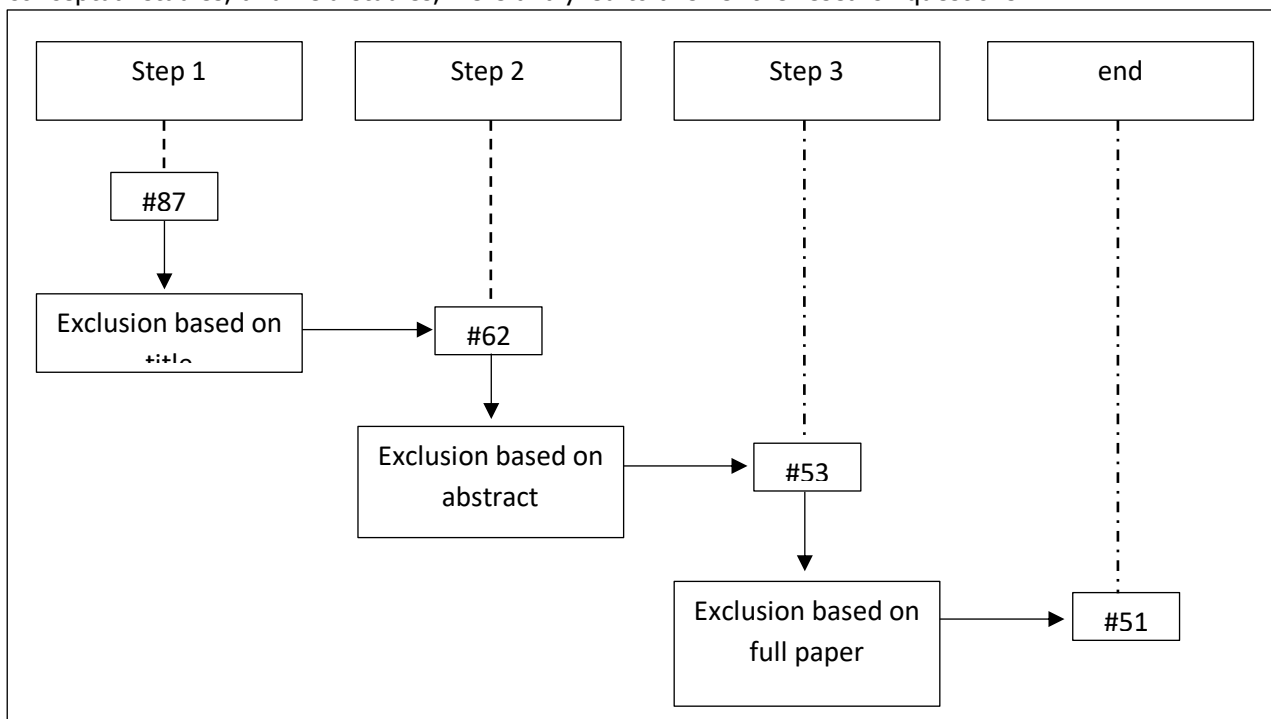
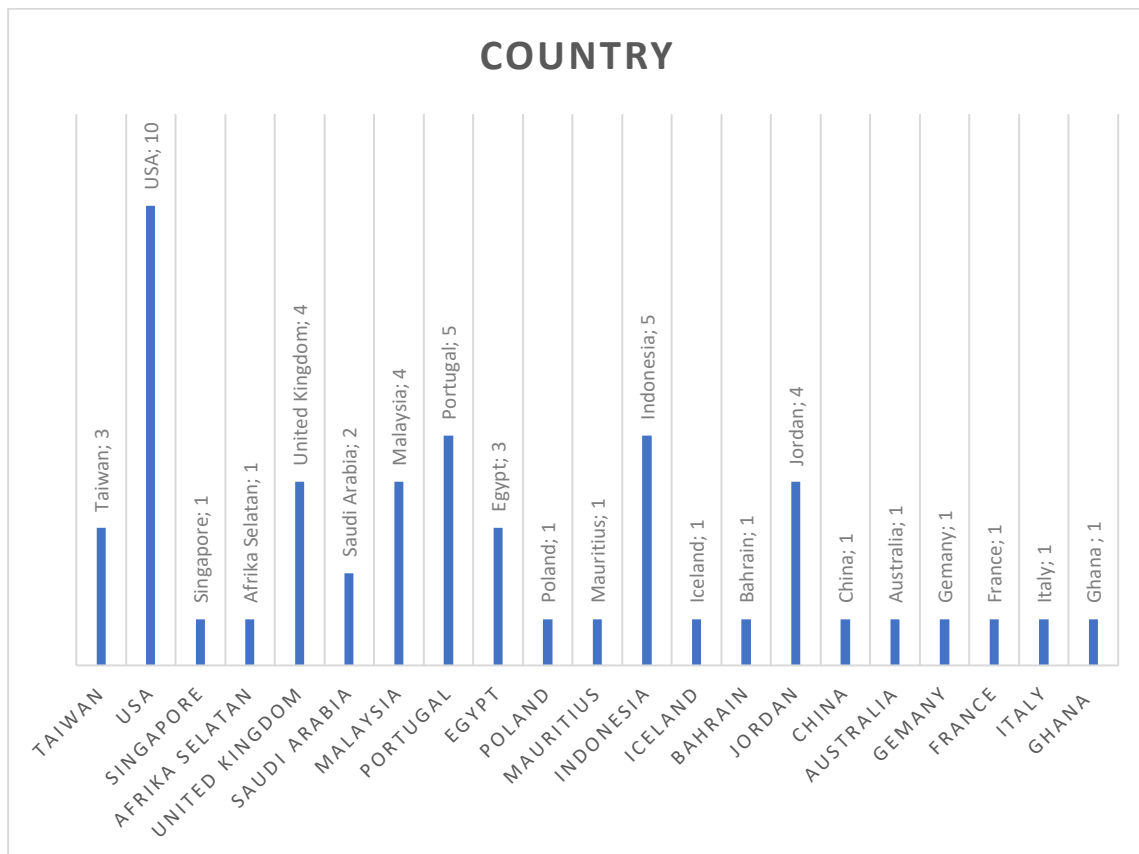


Figure 1. Process of Study Selection

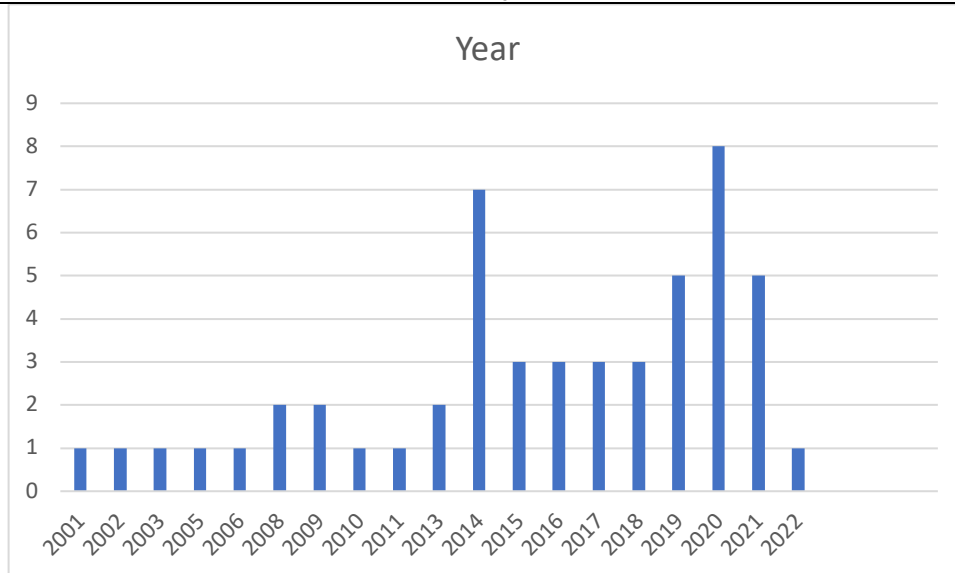
**Table 1. Potentially Eligible Studies and Selected Studies**

Sources	Potentially eligible studies	Selected studies
Elsevier	16	14
Emerald Group Publishing	14	14
Inderscience Enterprises Ltd	1	1
IEEE Publishing	6	6
David Publishing	1	1
American Accounting Association	1	1
Association for Computing Machinery	2	2
John Wiley and Sons Ltd	2	2
Little Lion Scientific	2	2
Springer International Publishing	2	2
IJSTR Publishing	1	1
Allied Academies	2	2
Springer Science and Business Media	1	1
Springer London	1	1
Growing Science	1	1

Once articles are selected, publication trends by each database are identified. The sample of articles resulting from this methodology were published between 2001-2022, as shown in Figure 1, but more than most of the studies were published in 2014 and 2020.



**Figure 2. Country List**



**Figure 3. Year List**

**Table 2. Journal Name**

No	Journal Name	Amount
1	International Journal of Accounting Information Systems	6
2	Journal of Accounting Education	1
3	Managerial Auditing Journal	8
4	Computers and Security	1
5	International Journal of Services and Standards	1
6	Journal of Information Systems	1
7	Industrial Management and Data Systems	1
8	International Journal of Accounting and Information Management	1
9	Advances in Accounting, incorporating Advances in International Accounting	1
10	Journal of Enterprise Information Management	1
11	Procedia Social and Behavioral Sciences	1
12	International Conference Proceedings Series	2
13	Journal of Applied Accounting Research	1
14	Iberian Conference on Information Systems and Technologies	5
15	International Journal of Auditing	1
16	Journal of Modern Accounting and Auditing	1
17	Journal of Theoretical and Applied Information Technology	2
18	Procedia Computer Science	1
19	Lecture Notes in Networks and Systems	2
20	International Journal of Scientific & Technology Research	1
21	Academia of Accounting and Financial Studies Journal	1
22	Advances in Intelligent Systems and Computing	1
23	Journal of International Accounting, Auditing and Taxation	1
24	Technological Forecasting & Social Change	1
25	Meditari Accountancy Research	1
26	Cognition, Technology & Work	1
27	International Journal of Information Management	1
28	accounting	1
29	Electronic Journal of Information Systems in Developing Countries	1
30	Academy of Strategic Management Journal	1
31	Asia-Pacific Conference on Computer Science and Data Engineering	1
32	VINE Journal of Information and Knowledge Management Systems	1

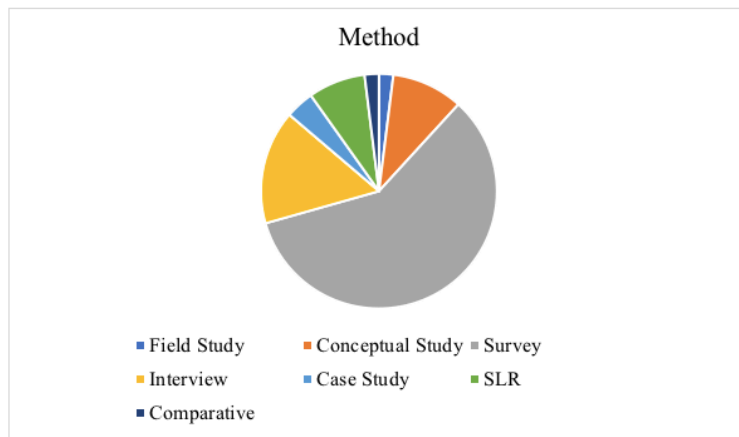


Figure 3. Method

**Analysis**

This section responds to the research sub-questions posed in planning the review.

**Q1: What are the factors that cause an auditor or company not to want to adopt CAATTs?**

Table 3. Analysis 1

Factors that Cause Auditors or Companies not to use CAATTs		
No	Factors	Reference
1	Low self-confidence.	(Kamal et al., 2020),(Mootooganagen Ramen et al., 2015)
2	Use of CAATTs is limited.	(Debreceeny et al., 2005)
3	Degree of difficulty	(Debreceeny et al., 2005),(Kim et al., 2009),(Al-Hiyari et al., 2019)
4	Cost effectiveness and efficiency	(Debreceeny et al., 2005),(Tamilmani et al., 2021)
5	Professional external auditors do not use CAATTs	(Debreceeny et al., 2005)
6	Level of confidence	(Huang et al., 2008)
7	The period of use of CAATTs in the evaluation is 3 years	(Curtis & Payne, 2008)
8	Partners of other business firms	(Huang et al., 2008)
9	individual characteristics	(Huang et al., 2008),(Kim et al., 2009)
10	There are other technologies that are more effective and efficient	(Lin & Wang, 2011),(Williams et al., 2015),(Jaber & Abu Wadi, 2018),(Dias & Marques, 2018),(Jiang, 2019)
11	Number of clients	(Ahmi & Kent, 2012),(Abou-El-Sood et al., 2015),(Rindang Widuri, Brendan O'Connell, 2004)
12	Technology availability	(Ahmi & Kent, 2012)
13	Personal experience and knowledge	(Ahmi & Kent, 2012),(Abou-El-Sood et al., 2015),(Inácio et al., 2020)
14	Management support	(Ahmi & Kent, 2012),(Widuri & Sari, 2017)
15	The perceived benefits are very small	(Vasarhelyi & Romero, 2014)
16	The number of available tools exceeds the number of users	(Pedrosa & Costa, 2014)
17	Poor confidence in CAATTs	(Mootooganagen Ramen et al., 2015)
18	Transparency and accountability factor	(Widuri & Sari, 2017)
19	There is no compulsion or voluntary use	(Al-Hiyari et al., 2019)
20	Respondents do not expect any changes in the field of auditing in the future	(Tiberius & Hirth, 2019)
21	CAATTs have not succeeded in revolutionizing auditing	(Awuah et al., 2022)

**Q2: What are the factors that make an auditor or company want to adopt CAATTs?**

**Table 4. Analysis 2**

<b>Factors That Influence Auditors to Use CAATTs</b>		
<b>No</b>	<b>Factors</b>	<b>References</b>
1	Several audit tasks can be performed by GAS and CAATTs	(Liang et al., 2001),(Abou-El-Sood et al., 2015),(Coelho & Gouveia, 2016),(Smidt et al., 2019),(Lamboglia et al., 2020)
2	Proper task coordination can increase time efficiency and work effectiveness	(Nieschwietz et al., 2002),(Maciejewska, 2014),(Coelho & Gouveia, 2016),(Susanto & Meiryani, 2018),(Al-Hiyari et al., 2019),(Manita et al., 2020),(Damer et al., 2021),(Mujalli & Almgrashi, 2020)
3	Present new technology supporting CAATTs that can solve audit problems from previous technologies	(Flowerday et al., 2006)
4	The client's IT complexity can adapt the audit program in response to the risk assessment	(Bierstaker et al., 2014),(Mazan & Lymer, 2014),(Ahmi et al., 2014)
5	Behavior control, supervisory norms, and business expectations	(Diaz & Loraas, 2010)
6	system stability	(Lin & Wang, 2011)
7	PB organizational readiness, pressure, background experience and age difference	(Razi & Madani, 2013),(Daoud et al., 2021)
8	Expected results and infrastructure technical support	(Bierstaker et al., 2014),(Pedrosa et al., 2020),(Al-Okaily et al., 2022)
9	Development of training programs on CAATTs	(Bierstaker et al., 2014)
10	Performance expectations	(Curtis & Payne, 2014)
11	Peer social influence, environment, and company size	(Pedrosa & Costa, 2014),(Kim et al., 2016),(Siew et al., 2020)
12	Trust	(Mootooganagen Ramen et al., 2015)
13	Language compatibility, regulators and support	(Rindang Widuri, Brendan O'Connell, 2004)"
14	There is an internal control strategy	(Rikhardsson & Dull, 2016)
15	Ease of use of CAATTs	(Kim et al., 2016),(Shihab et al., 2017)
16	Prevent data corruption	(Susanto & Meiryani, 2018),(Bradford et al., 2020),(Kamal et al., 2020)
17	Individual factors	(Mohamed et al., 2019),(Bradford et al., 2020),(Pedrosa et al., 2020)

## **DISCUSSION**

### **About the factors of audit use CAATTs or otherwise**

The level of confidence of an audit in using its technology, audits that cannot use CAATTs technology tend to be not proficient in using technology. However, the audits stated that the Audit Control Language (ACL) training could help them understand the mechanism of CAATTs.

Limitations of using CAATTs, this is an obstacle when partners from companies do not use similar technology. Coupled with the difficulty factor of using CAATTs, cost effectiveness, and other internal companies using different mechanisms.

Perceived ease of use of CAATTs does not have a significant effect on the use of CAATTs, this could be due to the effectiveness and efficiency in the use of the technology, where an audit still takes a long time to adapt and become proficient in using the technology. The convenience factor is also a supporting factor in the use of new technology, if an audit is not comfortable using the advanced features contained in CAATTs, then usually the audit will not use the technology even though the technology has many benefits.

Use of other software in a company, this is because the cost of using the software tends to be cheap and in accordance with the size of the company, where small companies don't really need CAATTs in conducting audits because there is no compulsion in using this technology. In addition, the small number of clients is also the reason because the many features offered do not suit the company's needs.

## CONCLUSION

This paper was carried out by means of a Systematic Literature Review on Computer Assisted Audit Tools and Adoption Techniques, 53 studies on this subject have been identified, however there are 51 studies related to this paper. Based on these studies, it can be concluded that the reason an audit does not use CAATs is due to factors of convenience, knowledge, cost, partners or other companies, and external coercion to use the technology is the main factor for an auditor to use the technology. For auditors who have an interest in the technology but cannot use it, they hope their company's IT team can assist them in using the technology, while for audits who already understand the technology but do not use it, it is because they feel uncomfortable using the technology. does not suit their needs as well as the company's.

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