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The impact of computer assisted auditing techniques in the audit process: an assessment of performance and effort expectancy

Anas Ahmad Bani Atta[a*], Haider Mohammed Baniata[b], Othman Hussein Othman[c], Basel J. A. Ali[d], Suhaila Waleed Abughaush[e], Nawaf Abdallah Aljundi[a] and Ahmad Yahiya Bani Ahmad[a]

[a]*Financial and Accounting Science Department, Faculty of Business, Middle East University, Amman, Jordan*
[b]*School of Business, Jadara University, Irbid, Jordan*
[c]*Department of Financial and Banking Management, Faculty of Business, Isra University, Jordan*
[d]*College of Economics and Management (CoEM), Al Qasimia University, Sharjah, United Arab Emirates*
[e]*Department of Accounting, Faculty of Economics and Management, University of Sfax, Tunisia*

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A B S T R A C T

The rapid advancement of technology has had a significant impact on a wide range of industries, including the auditing industry. It is now obvious that employing Computer Assisted Auditing Techniques (CAATs) is a possible tactic for enhancing the effectiveness and efficiency of the audit process. This study evaluates how CAATs affect auditors' expectations for performance and effort in Jordan. Through a comprehensive survey of Jordanian auditors, this research provides insights into the factors that drive CAATs adoption. Utilizing structural equation modeling, the study confirms that both Effort Expectancy and Performance Expectancy positively influence CAATs adoption. These relationships are supported by robust path coefficients and low P-values, indicating statistical significance. The results of this study should clarify the possible advantages of including CAATs in the audit process and point out any difficulties auditors could encounter. Companies and professionals may choose wisely whether to embrace and use CAATs by comprehending Performance Expectancy and Effort Expectancy.

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1. Introduction

The paradigm of auditing as a discipline is information systems audit (Purnamasari, Amran, & Hartanto, 2022). In Jordan's small and medium-sized businesses, information systems (IS) auditing is still in its infancy stages (Ali & Oudat, 2021). IS auditors are presently providing audit assurance to organizations, but with some caveats (Wang & Yang, 2009). The purpose of these auditors is normally to evaluate the efficiency and adequacy of the internal controls that have been implemented within information systems (Shan et al., 2022). One might also draw the conclusion that the quick advancement of technology has resulted in new requirements for auditing processes (O Jawabreh et al., 2023). As a result, the utilization of information technologies presents a challenge to conventional audit tasks (Allahham et al., 2024a). Furthermore, utilizing conventional audit techniques to carry out audit tasks is challenging due to the rapidly evolving technology (Al-Hosaini et al., 2023; Al-Hussein et al., 2023; Ali et al., 2023).

It is crucial for auditors to adopt more appropriate auditing procedures as the corporate sector progressively replaces paper-based approaches with electronic ones (Alqaraleh et al., 2022; Hezabr et al., 2023). Considering this, audit must start moving away from human detection and focus more on technology-based detection and prevention (Hatamlah et al., 2023; Saleh et al., 2023; Salhab et al., 2023). There are several technical tools available to help auditors in their auditing work. By using

* Corresponding author.
E-mail address: Abaniattah@meu.edu.jo (A. A. B. Atta)

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live/extracted data from numerous applications, General Audit Software (GAS), for instance, was created to assist auditors in auditing and evaluating (Debreceny et al., 2005). To assist auditors in their auditing work on computerized accounting data, computer assisted auditing techniques (CAATs) have been proposed. Once the data has been collected from the client's system utilizing GAS tools, it is examined using statistical analysis and audit expert systems (Debreceny et al., 2005). The primary purpose of CAATs systems, in addition to the functions already described, is as an audit tool to improve the efficacy and efficiency of auditing (Pedrosa & Carlos, 2012).

The use of computer-assisted audit application tools by audit organizations to complete audit activities is referred to as the adoption of audit technology (Alqaraleh et al., 2022; Hezabr et al., 2023). Previous studies that looked at how technological innovations were adopted mostly discussed technology adoption (Venkatesh & Bala, 2012). According to a previous study (Braun & Davis, 2003), CAATs are recognized as cutting-edge technologies that assist internal and external auditors in the auditing of performance, tests, and tasks. This is the case since CAATs may automate manual processes. The technologies range from straightforward procedures (e-working papers) and software for statistical analysis to artificial intelligence capabilities that can anticipate issues in financial accounts. (Braun & Davis, 2003; Hall, 2016). The use of CAATs, according to, offers auditors and audit firms benefits including lower audit costs, greater audit quality and productivity, prompt maintenance of audit reports, and increased audit effectiveness and efficiency. Additionally, CAATs give auditors the ability to physically do difficult tasks while verifying internal controls. Curtis and Payne (2008), PCAOB (2010), and AICPA (2006). The implementation of CAATs heightens the responsibilities of fraud detection as required by SAS No. 99 and enhances the effectiveness of control testing as needed by Section 404 of the Sarbanes-Oxley Act. However, other research found that small and medium-sized audit companies hardly ever used CAATs. According to (Mansour, 2016), even though professional software has been developed to satisfy their auditing demands, auditors in the context of Jordan have shown a sluggish adoption of CAATs. Therefore, the goal of this study is to shed light on the barriers to auditor acceptance of CAATs. In Jordan, computer assisted auditing techniques (CAATs) enhance and boost the efficiency of the auditing process. The usage of CAATs in Jordan increases the capacity to spot more exceptions, enhances audit effectiveness, and lowers the risk of unintentional mistakes in business processes.

2. Literature Review

2.1 Performance expectancy

Evidence suggests that auditors' intentions to utilize CAATs are influenced by their performance expectations (Almagrashi, Mujalli, Khan, & Attia, 2023). The impact of performance expectancy on auditors' desire to utilize CAATs, however, is supported by empirical data. According to auditing rules and recommendations, the use of technological tools may help to improve auditing efficiency and effectiveness. According to previous research on CAATs, auditors who use them can perform a variety of relevant tasks, such as test program controls (Janvrin et al., 2009); risk assessment during various audit planning processes (Paukowits & Paukowits, 2000); and increased audit test efficiency. It might be claimed that this is a coherent statement, with perceived usefulness considered in performance expectancy creation in the UTAUT context, and that CAATs can therefore be regarded as important instruments in auditing procedures. The degree to which someone believes employing technology will improve their performance at work is known as perceived usefulness (Davis, 1989). The empirical evidence of the impact of performance expectancy on auditors' inclination to utilize CAATs in other relevant areas. Several research have already investigated the connection between auditors' use of CAATs and performance expectations (Almagrashi et al., 2023). However, this research' findings were not definitive. For instance, Krishnaraju et al. (2013) concluded that Web Personalization had little to no moderating effect on the link between performance expectations and new technology utilization. More specifically, it was discovered that the e-Government passport site was not directly linked to any improvement in job- or task-related performance, but rather, in the consumer case, it was linked to an increase in task-oriented efficiency, suggesting that users do not associate performance improvement with the e-Government passport site. Similar findings were made by Van Dijk, Peters, and Ebbers (2008) when they examined the factors influencing the adoption of e-government in the Netherlands and discovered that performance expectancy was unhelpful for forecasting the use of new technology. Two additional studies that supported the conclusion that performance expectancy is ineffective in predicting use of new technology include Birch and Irvine (2009), which looked at Canadian teachers' adoption of electronic-based classrooms, and Sumak et al. (2010), which looked at Slovenian university students and faculty members' adoption of virtual learning. The use of technical tools may assist to increase auditing efficiency and effectiveness, in accordance with auditing principles and recommendations, IIA Standard 1220.A2, 2014). Researchers have found that auditors who use CAATs can carry out a range of pertinent tasks, including test program controls (Pogrob & Isenberg, 1999; Janvrin et al., 2009); extensive insight into IT controls; risk assessment during various audit planning processes (Allahham et al., 2024b); and improved audit test efficiency. Thus, it might be claimed that CAATs are important instruments in auditing procedures and that this is a coherent assertion, with perceived utility considered in the design of performance expectancies in the UTAUT setting. The degree to which someone believes employing technology will improve their performance at work is known as perceived usefulness (Davis, 1989). The hypothesis is based on five previous theories and models of technology uptake and use. For instance, the perceived usefulness of TAM, the relative advantage of IDT, the extrinsic incentive of C-TAM-TPB, the job-fit of MM, and the result expectation in SCT are all synonyms for performance expectations. (Compeau, Higgins, & Huff, 1999). These earlier models were presented in Venkatesh et al.'s (2003) paper, along with the previously described UTAUT. According to Venkatesh et al.'s (2003)

definition of performance expectation (p. 447), it is "the degree to which an individual believes that using the system will help him or her to attain gains in job performance". However, several empirical investigations support the considerable link between performance expectations and CAAT usage, while also reporting an inconsequential link. Table 1 displays a few investigations.

Table 1
Selected Studies Related to Performance expectancy Variable

Author	Context	Sample	DV	Result	
				Sig	Insig
Deniswara et al. (2023)	Jakarta	62 auditors	CAATs Adoption		√
Mustika et al. (2023)	Bandung	13 public accounting firms	Usage of CAATs	√+	
AbdulGhani et al. (2023)	Malaysia	117 auditors	CAATs Adoption	√+	
Handoko et al. (2021)	Indonesia	158 auditors	CAATs Adoption	√+	
Aljamal et al. (2021)	Jordan	255 auditors	Usage of CAATs	√+	
Daoud (2023)	Jordan	173 auditors	Usage of CAATs	√+	
Victor (2011)	South Africa	١١ auditors	Use and Adoption of CAATs	√+	
Mahzan and Lymer(2008)	UK	192 auditors	CAATs Adoption	√+	
Krishnaraju et al. (2013)	Indian	143 respondents	E-Government		√
Shamsuddin et al. (2015)	Malaysia	108 auditors	(CAATs)	√+	
Diane Janvrin et al. (2008)	USA	181 auditors	CAATs usage	√+	
Cheng et al. (2011)	Taiwan	264respondents	IT		√
Bierstaker et al. (2014)	USA	181 auditors	CAAT use	√+	
Van Dijk et al. (2008)	Netherland	1225 respondents	E-Gov		√
Wu et al. (2012)	Taiwan	201 responses	I Pass		√
Yu (2012)	Taiwan	441respondents	Mobile Banking	√+	
Tumi (2013)	Libya	137 auditors	using CAATs and CA		√
Mansour (2016)	Jordan	156 auditors	Adopt and Use CAATs	√+	
Foon and Fah (2011)	Malaysia	200 respondents	Internet Banking	√+	
Birch and Irvine (2009)	Canada	82 auditors	E-learning		√
Ramen et al. (2015)	Mauritius	581 auditors	CAATs Adoption	√+	
Mahzan and Lymer (2009)	UK	10 internal auditors case studies	Adopt (CAATs)	√+	
Alrawashdeh et al. (2012)	Jordan	290 employees	E-learning	√+	
Sumak et al. (2010)	Slovenia	235 students	Virtual Learning		√
Tarhini et al. (2016)	Lebanon	377 users of e-learning	E-Learning	√+	
Payne and Curtis (2008)	US	196 auditors	Computer-aided Audit	√+	
Yahya et al. (2011)	Malaysia	35 respondents	E-Sharia Portal	√+	

*+ the direction of relationship is positive

Like Venkatesh et al. (2012), several additional research used UTAUT to look at how various technologies were adopted in diverse contexts and nations. For instance, Paledi (2011) investigated the usage of CAATs in South Africa, looking at how performance expectations are positively correlated with the implementation of CAATs by information systems auditors. The anticipated statement's correlation findings are accurate since they demonstrate a strong connection. These findings suggest that the effectiveness of the system, the caliber of the output it produces, the applicability and simplicity of its integration into audit engagements, and the rise in auditor productivity all have an impact on the system's acceptance and use as well as the way auditors will employ it. Additionally, Tumi (2013) focused on the adoption of CAATs in the Libyan instance and showed that high costs were associated with the employment of expert auditors and that high costs of effective software were associated adversely with CAATs. However, the effect did not change much based on AF sizes. Mustika et al. (2023) this study aims to analyze independent auditors' perceptions and how it affects the adoption of CAATs. The respondents were auditors at public accounting firms in Bandung. The perceived complexity of CAAT, the difficulties in applying the procedures, and voluntariness of application all had a little negative impact, while social influence and performance expectations had no appreciable negative impact. Mahzan and Lymer (2008) claim that users had the same high expectations for CAAT performance as internal auditors had for them as an important instrument for use in auditing activities. Such a notion is consistent with the UTAUT model's performance expectation construct's presumption that perceived usefulness is covered. In addition to the studies previously stated, Shamsuddin et al.'s (2015) study discovered a strong and favorable correlation between the frequency of CAAT usage and performance expectations, indicating that internal auditors with greater performance expectations will use CAATs more frequently. In other words, internal auditors would efficiently execute their tasks using CAATs, hence raising the caliber and productivity of their work. Deniswara et al. (2023) examined the variables that influence the acceptability of Computer Assisted Audit Techniques (CAATs) on external auditors in Public Audit Firms in Jakarta using the Unified Theory of Acceptability and Use of Technology (UTAUT) approach.

The impact of performance expectations on forecasting technology use has recently improved. For instance, a 2008 study by Diane Janvrin, et al. examined the use of CAATs and their perceived usability. In Performance expectation (PE), which is the best indicator of CAAT adoption, relates to how strongly a user believes that using CAATs would help them achieve meaningful benefits. Furthermore, as demonstrated by Mahzan and Lymer (2009), performance expectation is notably demonstrated in the case studies as a key incentive in the adoption of CAATs. In fact, six out of ten instances showed that this was the primary driver behind the adoption of CAATs since the benefits they brought with them may increase their productivity at work. It was claimed that the internal auditors' automation of the audit process and overall process was shown by their deployment of CAATs. Despite the recent progress, research in South Africa and Libya produced results that were different

from those found in the USA and UK. Researchers Janvrin, et al. (2008) and Bierstaker et al. (2014) examined the adoption of CAATs in the USA. Lastly, Wu, Yu, and Weng (2012) conducted research on the usage of e-tickets by railway passengers in Taiwan and presented findings that differed from those of Foon and Fah (2011), Alkhazaleh et al. (2021), and Alrawashdeh et al. (2012).

The auditors of the businesses audit may have doubts about the system's effectiveness because the technology under inquiry (CAATs) is relatively new in Jordan (Khaddash & Siam, 2003; Okab, 2013). how well the system performs in relation to adoption and implementation. The study's main hypothesis was that auditors' intentions to utilize CAATs rely on how well they think the technology is working. The more they believed the technology might boost their company's productivity, the more they planned to use it. It's interesting to note that similar studies on the use and adoption of CAATs in South Africa and the USA, respectively, conducted in developing countries (Paledi, 2011) and developed countries (Bierstaker et al., 2014), have demonstrated a significant positive relationship between performance expectancy and will favorably influence their adoption and use. Studies on the adoption of CAATs in Mauritius (Ramen et al., 2015), e-learning in Lebanon (Tarhini et al., 2016), computer-aided audit in the US (Payne and Curtis, 2008), internet banking in Malaysia (Foon and Fah, 2011), and mobile banking in Taiwan (Yu, 2012), among others, have all discovered a strong positive correlation between performance expectations and use of new technology.

This discovery conflicts with In 2013, Tumi looked at the use of CAATs and CA in Libya. Their findings suggested that performance expectations have little bearing on how technology is used, as seen by the difficulties experienced by auditors in implementing CAATs, which have a detrimental influence on CAATs utilization. Along with expensive, effective software, the implementation expenses related to trained auditors, and the effort expectation of usage, the absence of infrastructure in the Libyan setting is the main barrier to the adoption of CAATs. The earlier study discovered no connection between performance expectations and the usage of new technologies. As a result, Daoud (2023) urges deeper research into the prior studies that have looked at the link between performance expectations and technology use. According to Bierstaker et al. (2014), perceived performance expectancy (PE) measures how certain a participant is that using CAATs would help them reap significant gains. In other words, CAATs can help auditors stay within their time budget since they reduce the amount of time needed to conduct control and substantive tests, increasing auditing effectiveness. Accordingly, this study investigates how performance expectations affect auditors' intentions to utilize CAATs. The use of CAATs in auditing procedures is perceived as being beneficial and productive by external auditors in Jordan, and this will favorably effect system acceptance and use. Performance expectations have a big impact on auditors' decisions to utilize CAATs. These results suggest that audit firm management may create training programs to increase how comfortable the auditors feel using the system when there is less CAAT use. The finding was that performance expectations had a substantial impact on the adoption of new technologies. The background and culture of earlier research, as well as the level of technical advancement and complexity, are identical.

2.2 Effort expectancy

Evidence suggests that auditors' intentions to utilize CAATs are influenced by their expectation of effort (Almagrashi, Mujalli, Khan, & Attia, 2023). But there is empirical proof that effort expectation has an impact on auditors' propensity to employ CAATs. After UTAUT was introduced to the IS research community, it was employed in a number of empirical studies to investigate the impact of effort expectation on the adoption of new technologies. These investigations produced contrasting results. For instance, Al-Gahtani, Hubona, and Wang (2007) investigated how Saudi Arabian knowledge workers perceived and used desktop computer programs. Their study's conclusion was comparable to Tumi's (2013). Paledi (2011)'s study, which examined the adoption and use of CAATs in South Africa, came to a similar result and showed the expectation of effort is positively connected with the technology used to use and deploy systems. This was demonstrated to be false, as there is no link between effort expectations and how auditors use the system. These findings suggest that information systems auditors are not primarily influenced by criteria like software training, software knowledge, and simplicity of use when deciding whether to utilize and deploy CAATs. Furthermore, the enabling conditions constructions, which were supposed to impact effort expectation, were shown to be false since there was no real connection between them. the actual data showing how effort expectation affects auditors' propensity to utilize CAATs in other relevant fields. Previous research has investigated the connection between auditors' usage of CAATs and their expectation of work. However, this research' findings were not definitive. For instance, the technology acceptance model (TAM) and TAM2 may both be linked to effort expectation. The construct is equivalent to perceived ease of use in Moore and Benbasat's IDT (1991), and ease of use in Davis et al.'s TAM (1989). All of these conceptions and the information system studies that followed have demonstrated how similar they are in terms of measuring scales and definitions (Venkatesh et al., 2003). UTAUT was created by combining these notions in the work of Venkatesh et al. (2003), and as a result, it was described as the "degree of ease associated with consumers' use of technology" (Venkatesh et al., 2012). As a result, this research defines it as the auditors' expected ease of use or level of difficulty in implementing CAATs during the audit process. However, several empirical research supports the considerable association between Effort Expectancy and the usage of CAATs, while also reporting some unimportant associations.

Table 2
Selected Studies Related to Effort Expectancy Variable

Author	Context	Sample	DV	Result	
				Sig	Insig
AbdulGhani et al. (2023)	Malaysia	117 auditors	CAATs Adoption	√+*	
Handoko et al. (2021)	Indonesia	158 auditors	CAATs Adoption	√+	
Deniswara et al. (2023)	Jakarta	62 auditors	CAATs Adoption		√
Mustika et al. (2023)	Bandung	13 public accounting firms	Usage of CAATs		√
Aljamal et al. (2021)	Jordan	255 auditors	Usage of CAATs	√+	
L. Daoud (2023)	Jordan	173 auditors	Usage of CAATs	√+	
Janvrin, et al. (2008)	USA	181 auditors	use of CAATs	√+	
Tumi (2013)	Libya	137 auditors	using CAATs and CA		√
Pedrosa, et al. (2015)	Portugal	20 respondents	use of Information Technology on statutory auditors' work	√+	
Marchewka et al. (2007)	USA	132 respondents	Courseware Mgt Software	√+	
Zainol et al. (2017)	Malaysia	120 SMPs	CAATs Adoption		√
Chang, et al. (2015)	Indonesia	Small and Medium Enterprises	nvestigate the social media adoption	√+	
Ojaide and Agochukwu (2017)	Nigeria	168 audit firms	using CAATs		√
AGOCHUKWU, (2016)	Nigeria	1263 respondents	CAATs usage	√+	
Zhou (2008)	China	250 valid papers	mobile commerce		√
Bierstaker, et al. (2014)	USA	181 auditors	CAATs usage	√+	
Wong et al. (2013)	Australia	112 student teachers	Interactive whiteboard	√+	
Widuri et al. (2017)	Indonesia		Use of Generalized Audit Software		√
Wills et al. (2008)	USA	52 represents	E-Medic Record	√+	
Gao and Deng (2012)	China	246	E-books	√+	
El-Gayar and Moran (2006)	US	263	Tablet PC	√+	
Curtis, (2012)	Jordan		Technology adoption and use in accounting.	√+	
Al-Gahtani et al. (2007)	Saudi	722 workers	IT		√
Maria and Ariyani (2014)	INDONESIA	auditors	E-AUDIT	√+	
Curtis and Payne (2014)	USA	75 in-charge auditors	CAATutilization decisions in auditing	√+	
Mahzan and Lymer (2014)	UK	10 internal auditors case studies	Adopt (CAATs)		√
Gehrke and Wolf, (2010)	Germany		Generalized Audit Software	√+	
Sumak et al. (2010)	Slovenia	235 students	Virtual Learning		√

*+ the direction of relationship is positive

The interviewees chosen for the mini-case studies were skilled users of CAATs about effort expectation, therefore the variable had no impact on the adoption choice. And Zhou's (2008) research, which also looked at how Chinese mobile commerce consumers' expectations of effort on the usage of new technology. Despite the fact that the aforementioned studies looked at various technologies (Al Tarawneh et al., 2023; Jawabreh et al., 2023; Jawabreh et al., 2023), (using CAATs and CA, desktop computer applications, adoption of CAATs, and mobile commerce) in various nations (South Africa, Saudi Arabia, the UK, and China), all the results showed that effort expectations had a negligible impact on the use of new technology. In a study that looked at acceptability, Janvrin et al. (2008) discovered that the adoption of new technology is highly impacted by effort anticipation. The degree of ease a participant connects with utilizing CAATs is referred to as effort expectations (EE). The degree to which participants feel that adopting CAATS will help them more effectively acquire substantial rewards is represented by the amount of work they anticipate being required to utilize the new system (i.e., effort expectation). Similar results were found in the studies by Marchewka et al. (2007), Payne and Curtis (2008), which investigated the adoption of electronic medical record systems by US healthcare personnel, Wills, El Gayar, and Bennett (2008), which examined how US university students perceived the acceptance and use of courseware management software, which looked at how US auditors adopted computer-aided audit systems. All these investigations were carried out in the US, where user sophistication and technology sophistication may be higher than in Asia and the Middle East.

According to research by Almagrashi, Mujalli, Khan, and Attia (2023) on CAAT adoption, perceived ease of use has a positive impact on the usage of new technology. These studies provide a consistently demonstrated theoretical effect of effort anticipation on the usage of new technologies. Similar studies have been done on the adoption of the I Pass among Taiwanese tourists by Wu et al. (2012) and the adoption of interactive whiteboards by Australian early childhood educators by Wong et al. (2013). While Van Dijk et al. (2008) studied the adoption of e-government in the Netherlands, Alrawashdeh et al. (2012) studied e-learning in Jordan. In this study, AbdulGhani et al. (2023) were investigated using the UTAUT, or Unified Theory of Acceptance and Use of Technology.

According to the concept of this construct, a user's level of expertise might influence how easy or complex an information system is to use. This is demonstrated by Venkatesh et al. (2003), who gathered data longitudinally over the course of three (3) separate periods. After training, effort expectations were considerable while using new technology for the first time, but as usage continued, they became less significant. Similar results were observed in both required and optional contexts, however only the first time period was statistically significant. Given their lack of experience using the system, the choice of non-users as research participants for the current study is therefore anticipated to provide a meaningful result. Further research

was necessary because of this and the inconsistent nature of the earlier findings, particularly about the use of CAATs in Jordanian audit companies. In the study on the adoption of CAATs in Mauritius, a substantial positive association between effort expectations and usage of new technology was also discovered (Ramen, et al., 2015). Like Diane Janvrin et al. (2008) discovered in their study on CAAT usage in the USA, Shamsuddin et al. (2015) discovered a strong positive link in their study on CAAT adoption. The influence of effort expectation on the employment of new technologies was repeatedly substantiated in the research cited above. The findings of other research in literature, however, have been contradictory. For instance, Bierstaker et al. (2014) did not produce a statistically significant result, which may have been due to the audit setting. Auditors must gather sufficient facts, so individual preferences about effort and social factors may not have a greater influence on a person's decision on which technology to use. These results suggest that the efficacy of the audit is the auditors' top concern when considering whether to use technology. According to Mahzan and Lymer (2009), internal auditors' motivation to implement CAATs is not influenced by effort expectation. The choice to utilize CAATs was not impacted by the effort expectancy construct since the interviewees used for each of the mini-case studies were experts in using CAATs. Like this, Sumak et al. (2010) investigated the factors influencing the adoption of virtual environments in the Slovenian example and found that students' acceptance of e-learning and usage of technology were unaffected by their expectation of effort. Additionally, the author of the Cheng et al. (2011) study examined the use of mobile e-learning by significant Taiwanese businesses. They came to conclusions that were different from those published by Sumak et al. (2010). Zhou (2012) and Yu (2012) reported a negligible impact of effort expectations on technology use on location-based services and mobile banking in the settings of China and Taiwan, respectively.

Conclusion: It has been shown that effort expectancy suggests that auditors are more likely to embrace CAATs when the system is simple to use and does not require extensive training. Performance expectations have a big impact on auditors' intention to use CAATs, thus each instrument needs to have a high degree of test-retest reliability. This indicates a strong consistency of auditors' replies, which will favorably promote system acceptance and use. These results on the CAATs' real usability aspects are important for the adoption of the audit approach. The result was that the utilization of CAATs was greatly impacted by effort expectations.

3. Research methodology

This study's goal was to increase UTAUT throughout the public accounting industry. Because of this, efforts were made to maintain the study technique in a manner that was extremely like that which was utilized by earlier studies on UTAUT in order to maintain the continuity of the research agenda. However, the questions that were picked from their validated surveys were modified such that they are relevant to the practice of CAATs. The research is a descriptive study that seeks to depict a phenomena or circumstance in order to achieve a particular choice. Two hypotheses have been developed for testing. Enough data is gathered to get a thorough grasp of the issue. This research calculates the influence of Performance Expectancy and Effort Expectancy on CAATs. Data was collected via a questionnaire. It has four parts and 19 components. The first part includes items on socio-demographic factors, the second on Performance Expectancy, the third on Effort Expectancy, and the fourth on CAATs. The items are scored using a seven-point Likert scale. 500 questionnaires were sent out to professionals in the Jordanian auditing business, with 202 replies used for analysis. These auditors have extensive expertise in their field. The variables, objects, and data sources are listed in Table 3.

Table 3
Items of the Questionnaire

No	Variables of the Study	No of Items	Adopted from Reference
1	CAATs	7	Purnamasari 2022
2	Performance Expectancy	6	Purnamasari 2022
3	Effort Expectancy	6	Mansour 2016

Two approaches were used to assess the questionnaire's validity and reliability. First, academic comment was gathered, and the items were suitably changed. Second, Cronbach's alpha was calculated for each construct to determine its internal consistency. CAATs (0.893), Effort Expectancy (0.899), and Performance Expectancy (0.909) all have alpha values greater than 0.7. the questionnaire is therefore valid and trustworthy.

3.1 Theoretical framework

The conceptual outline of the theoretical framework that explains the influence of performance and effort expectations on CAATs is shown in Fig. 1.

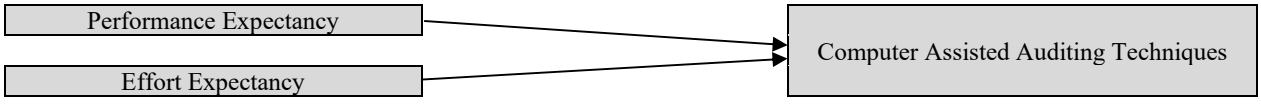

Fig. 1. Conceptual Model

4. The study's analysis

Outer loadings

The Outer Loadings test, conducted in SMART PLS, has significant importance in the process of assessing the validity of a measurement model. The evaluation assesses the degree to which observable variables (indicators) are successfully linked to their corresponding latent constructs. The assessment is crucial in guaranteeing that the measurement model accurately reflects the intended theoretical concepts (Hair et al., 2017). In this test, each observable variable is assigned an outer loading value that quantifies the degree of its correlation with the latent construct. Higher loading values, often above 0.7 or 0.8, demonstrate a substantial association between the observed variable and the latent concept, suggesting a reliable indicator (Hair et al., 2017). Conversely, lower outer loading values may suggest that a measured variable is not effectively capturing the underlying construct, necessitating modifications or exclusion from the model. In general, the Outer Loadings test plays a significant role in enhancing the accuracy of the measurement model by retaining robust indicators and improving or eliminating weaker ones. The preservation of the validity and reliability of the measurement model serves to enhance the overall quality of the research findings (Hair et al., 2017). According to the data shown in Table 4, all items have values greater than 0.7. According to the Hair, et al (2017) standards, all options mentioned are deemed appropriate.

Table 4
The results of the factor loading

	Computer Assisted Auditing Techniques	Effort Expectancy	Performance Expectancy
CAATs1	0.792		
CAATs2	0.814		
CAATs3	0.761		
CAATs4	0.773		
CAATs5	0.787		
CAATs6	0.771		
CAATs7	0.764		
EE1		0.788	
EE2		0.803	
EE3		0.848	
EE4		0.809	
EE5		0.850	
EE6		0.793	
PE1			0.860
PE2			0.804
PE3			0.828
PE4			0.828
PE5			0.864
PE6			0.793

Validity and reliability assessments of the measurement constructs used in this study

Based on Table 5. Cronbach's alpha values between 0.893 and 0.909 for the constructs (Computer Assisted Auditing Techniques, Effort Expectancy, and Performance Expectancy) indicate high reliability (Nunnally, 1978). Composite dependability: scores between 0.894 and 0.912 suggest strong construct dependability, validating the consistency of the indicators (Dillon, Kumar, & Mulani, 1987). Convergent validity is shown by AVE values between 0.609 and 0.689, which indicate that the constructs can adequately account for the observed variance in the variables (Fornell & Larcker, 1981). The analysis's findings corroborate the reliability, internal consistency, and convergent validity of the measurement constructs, proving the measurement model's worth.

Table 5
Validity and reliability of the construction

	Cronbach's alpha	Composite reliability	Average variance extracted (AVE)
Computer Assisted Auditing Techniques	0.893	0.894	0.609
Effort Expectancy	0.899	0.902	0.665
Performance Expectancy	0.909	0.912	0.689

Discriminant validity

Table 6 displays the findings of analyzing our measurement constructs Computer Assisted Auditing Techniques, Effort Expectation, and Performance Expectation using the Fornell-Larcker Criteria. Values on the diagonal, such as 0.816 for Effort Expectancy, are consistently higher than values off the diagonal, such as 0.599 for Effort Expectancy and Computer Assisted Auditing Techniques, which is a noteworthy conclusion. This shows that the indicators for a given concept are more strongly correlated with one another than with the indicators for other constructs. This means our measuring methodology is very

discriminant. In conclusion, our method makes sure there is no duplication or ambiguity between the latent components in our study, making our research more solid.

Table 6
The Fornell-Larcker Criteria

	Computer Assisted Auditing Techniques	Effort Expectancy	Performance Expectancy
Computer Assisted Auditing Techniques	0.781		
Effort Expectancy	0.599	0.816	
Performance Expectancy	0.569	0.762	0.830

Method of Measurement

When using SMART PLS as an analytical tool, empirical research relies heavily on the measurement model, a fundamental part of structural equation modelling (SEM). This model establishes a bridge between the unobservable indicators or survey questions used to quantify theoretical constructs like Performance Expectancy and Effort Expectancy and the observable indicators or survey questions that measure these structures. The measurement model clarifies the operationalization and quantification of Performance Expectancy, Effort Expectancy, and CAATs Utilisation for the purposes of this study. SMART PLS facilitates this process by helping researchers establish connections between latent components and the overt manifestations of those components. This model may be used by researchers to ensure that their measurement tools are valid and reliable, and that they effectively capture the relevant theoretical concepts. In addition, SMART PLS may be used to estimate the magnitude and direction of these correlations, which is essential for developing more sophisticated structural models. Researchers may evaluate and analyze the correlations between crucial variables in their study in an objective manner thanks to the measurement model, which is applied by SMART PLS.

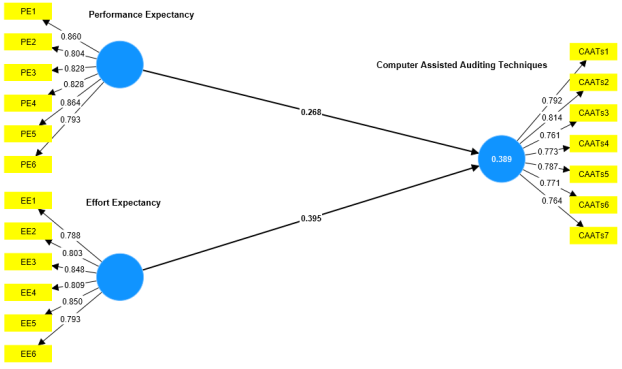

Fig. 2. Measuring Model

Structural Model Analysis

As can be seen in Fig. 3, the Structural Model analytic is a crucial part of the SmartPLS analytic process used in this study. The purpose of the SmartPLS-based Structural Model Analysis is to measure the statistical significance and amplitude of these connections. Researchers utilize this stage to test their hypotheses about the relationships between independent factors (Performance Expectancy and Effort Expectancy) and the dependent variable (CAATs). A visual depiction of the research model's structural connections is shown in Fig. 3 using the Structural Model Analysis. Using this methodology, scientists may better grasp the complex dynamics of the system under study. In a nutshell, Figure 3 is a visual representation of the correlations studied during the Structural Model Investigation performed using SmartPLS. The study sheds light on the ways in which hidden factors affect CAATs in Jordan's auditing sector.

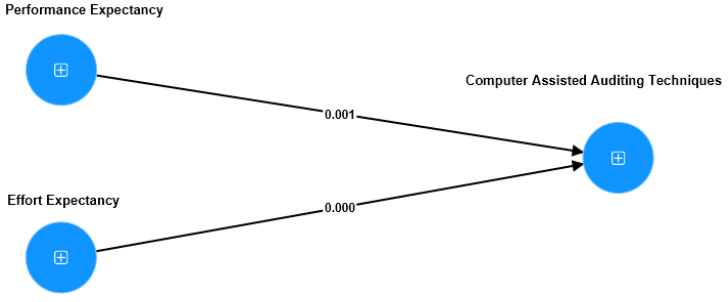

Fig. 3. Analysis of a Structural Model

Analysis of Path Coefficients and Hypothesis Confirmation

Table 7 summarizes the route coefficient examination, which was critical in establishing our research hypothesis about the effect of Effort Expectancy and Performance Expectancy on the use of (CAATs). In this part, we present a condensed overview of the outcomes in relation to our hypothesis:

H_1: *There is a positive effect of effort expectancy on computer-assisted auditing techniques.*

A positive correlation between Effort Expectation and the use of CAATs (coefficient of 0.395) indicates their presence. Consistent with the reasoning presented in H1, the statistical significance of this positive relationship is supported by a P-value of 0.000.

H_2: *Performance expectancy favorably affects computer-assisted auditing techniques.*

Measured Path Coefficient: There is a strong positive correlation between Performance Expectancy and the use of CAATs, as shown by the coefficient of 0.268. Statistical Significance: The P-value of 0.001 is very significant, lending more credence to the positive correlation hypothesized in H2.

In conclusion, the data in Table 7 supports our study's hypothesis. Using CAATs in audits is related to higher levels of effort expectation and performance expectation, as shown by the route coefficients. These results provide credence to our study's premise by demonstrating the dependability and importance of our research findings.

Table 7
Calculating path coefficients

	Original sample	Sample mean	STDEV	T value	P values
Effort Expectancy positively influences CAATs	0.395	0.394	0.087	4.564	0.000
Performance Expectancy positively influences CAATs	0.268	0.274	0.080	3.356	0.001

R square Test

To evaluate the efficacy of a statistical model in explaining variance in Computer Assisted Auditing Techniques, researchers use the R-squared and R-squared adjusted statistics. Square root (R2): It shows that around 38.9 percent of the variance in CAATs use can be accounted for by the variables in the model. R2 = (Square root of) the adjusted R2. This estimate of 0.385 considers the complexity of the model and the size of the sample. Despite the model's intricacy and large number of variables, it seems to account for only around 38.5% of the observed variance in CAATs use. Larger numbers indicate a better match between your model and the data, but you should consider other context-specific aspects when drawing conclusions from these statistics.

Table 7
R Square

	R-square	R-square adjusted
Computer Assisted Auditing Techniques	0.389	0.385

5. Conclusion and future studies

Therefore, including Computer Assisted Auditing Techniques (CAATs) into the audit process has shown enormous promise for increasing audit effectiveness and efficiency. The purpose of this conceptual framework was to study how CAATs influenced auditors' views of two crucial variables, effort, and performance expectations.

The word "performance expectation" refers to the benefits and improvements auditors anticipate gaining from using CAATs. Using modern data analytics, automated testing, and data visualization tools, auditors may improve accuracy, speed up analysis, and get greater insight into financial data. Therefore, audit quality improves, risks are better addressed, and financial reporting becomes more robust. The framework's results show that auditors generally have positive attitudes about CAAT implementation and are aware of how effectively they may affect audit outcomes.

The perceived ease of use and comfort of integrating CAATs in the audit process is referred to as Effort Expectancy. Because these technologies usually need training and talents, there may be concerns about the learning curve and time commitment required to become successful in their usage. However, as user-friendly interfaces and comprehensive training programs develop, entry barriers are decreasing (Al-Khasawneh et al., 2022). The framework's findings imply that, despite initial skepticism, most auditors ultimately see that the long-term benefits of CAATs outweigh the initial effort necessary to integrate them into their workflows.

Additional needs for successful CAAT adoption include a receptive business culture, enough resources, and organizational support. A supportive environment that encourages lifetime learning and skill development is required for auditors to fully

implement CAATs. Although the findings of this conceptual framework suggest that CAATs improve the audit process, it is crucial to note that each firm will have a unique experience. The extent of CAAT adoption and its ensuing repercussions may be determined by numerous factors, including the firm's size, the complexity of the audit engagements, and the auditor's technological skills.

Finally, the application of CAATs in the audit process has the potential to alter the auditing profession by increasing audit quality, effectiveness, and efficiency. To stay ahead of the auditing profession as technology advances, auditors and audit firms must embrace the potential of CAATs and constantly alter their practices. By doing so, auditors may increase their standing as trustworthy consultants while also contributing significantly to the accuracy of financial reporting and the public's trust in the financial system. This research suggests that in future studies, additional factors be used, and that moderator or mediator variables such as innovation or organizational culture be investigated.

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