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FACTORS INFLUENCING THE USE OF COMPUTER-ASSISTED AUDIT TECHNIQUES IN THE DIGITAL ERA

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Abstract. Digitalization is a challenge of the current environment, and the digital transition has extended to the audit profession. It affects the technology used by clients and the pressure on auditors by audit regulations to apply and use computer-assisted audit techniques (CAATs). The results of specialized literature indicate that the application and use of CAATs in auditing practice are limited. Thus, the present research aimed to investigate the factors that could influence the use of CAATs by auditors, based on the Unified Theory of Acceptance and Use of Technology (UTAUT). The empirical investigation consisted of 112 questionnaires that were analyzed by external auditors. The research results indicated a positive influence on the behavioral intention to use CAATs, which was influenced by performance expectations and facilitating conditions. In contrast, effort expectations and social influence did not affect the behavioral intention to use CAATs. We conclude that management should have a greater involvement in encouraging the use and application of CAATs, including supporting the process with the necessary resources. This work augments the knowledge of the factors that influence the behavioral intention to use CAATs among auditors in Romania and can be a useful resource for practitioners.

1. Introduction

The increasing potential provided by digital transformation and the escalation of audit requirements require changes in activities and human resources. These aspects are a few of the many topics that drive the discussion regarding future developments in the wake of digital change. The modern work environment is influenced by digitization, flexibility, and a multitude of other factors that present new challenges and necessitate changes to the structure and work culture of organizations. These adjustments ultimately affect the personnel within these entities.

The audit market in Romania is characterized by high competitive pressure and the domination of large auditing companies. In addition, increasingly complex international business models and more elaborate IT environments due to growing volumes of electronic data are heightening the demands on auditors.

Many business transactions are processed solely using electronic means. The complexity of these methods and the escalation of paperless processing have intensified audit risks because structures have become increasingly opaque and the large amount of data collected is no longer easily managed using manual processes (Nerantzidis et al., 2022; JS et al., 2024). With the emergence of remote work (i.e., the flexibility offered to employees to work from anywhere at any time), the separation of professional activities from personal life has become less distinct (Geraldes et al., 2019; Iran Mahd et al., 2024). In addition, digitization has a major impact on the way entities operate. Although the use of digital tools generally results in increased efficiency, the proportion of digital work environments is constantly expanding, which allows employees the ability to work from any location and be available at any time. These circumstances can lead to a lack of recovery and self-injurious behaviors such as mental illnesses (Kossek, 2016; Scott et al., 2017; Usmani et al., 2022).

Information technology is an inseparable part of modern business that contributes to the success of an entity. Electronic systems are ubiquitous in business environments and constantly increasing in complexity; therefore, accounting professionals regularly face challenges and risks related to the use of innovative new technologies. Although the simplification of financial statement preparation is a benefit of digitalization, the verification of these statements requires increasingly complex auditing processes due to the sophistication of these new systems. Thus, to increase their efficiency, auditors turn to computer-assisted audit tools and techniques (Handoko & Wijaya, 2020; Siew et al., 2020; Pedrosa et al., 2020; Atta et al., 2024).

Despite extensive analysis of the acceptance and use of computer-assisted auditing techniques (CAATs) by auditors, research gaps remain, particularly regarding the application of the Unified Theory of Acceptance and Use of Technology (UTAUT). For example, the specific cultural and organizational contextual factors that influence the acceptance and use of CAATs have been little studied. While UTAUT factors such as performance expectations, effort expectations, social influence, and facilitating conditions are well-documented (Venkatesh et al., 2003), the variation of these factors across different international and organizational contexts is unclear. The present study presented a fundamental overview of the current research and application of CAATs in Romania, considering that several studies in the specialized literature have addressed CAATs thematically. The main research objective of this study was to identify factors that affect the adoption of CAATs as part of the audit process in Romania, with the UTAUT as the underlying theory. Most studies have focused on individual topics relating to the use or design of CAATs. To determine the past and current contribution of digitization to the development of auditing and the audit system, the current study focused on the following research questions: What is the status of the application and use of CAATs in audit activities? What are the possible perspectives for digital audits? Which factors of the UTAUT influence the adoption of CAATs?

A generalized answer to these questions is not possible due to the heterogeneous structure of the examination arrangement. The purpose of this investigation was to determine the importance of digitization in the current examination environment and the level of support it can provide to future audit processes. In addition, the research findings provide insight into how digitization has changed regulatory and examination practices. Furthermore, the research, development, and support needs that have arisen as part of the digital transformation are identified and the related challenges are highlighted (Ionaşcu et al., 2022; Atta et al., 2024).

The present research focused on the UTAUT using an empirical study based on a questionnaire distributed to auditors. The survey investigated the central promoters of the audit

system in an attempt to discover the key elements that influence the digitization of the system, the challenges involved in overcoming the transformation process, and ideas for the design of the audit system. This study extended existing technology theory by deepening our understanding of the factors influencing the adoption of CAATs in Romania. The information obtained is particularly relevant for legislators, regulators, and decision-makers. The study provided important insights into the adoption of CAATs with reference to the UTAUT model, thereby providing practical guidance for practitioners and professional bodies. Empirical evidence has shown that performance expectations and enabling conditions increased the willingness of examinees to use CAAT, with a positive relationship between intention to use and actual use. This highlights the need for strong government support and a positive attitude among investigators toward these technologies. In addition, this study provided new insights, using the Romanian context, which can help governments and regulatory authorities raise awareness of the importance of IT training and education to improve the efficiency, effectiveness, and cost-effectiveness of audit services. Furthermore, these results provide a valuable resource for researchers to understand the current status of the use of CAATs in Romania.

The present study adopted the following method to address the current information gap: first, research of the existing literature was conducted to identify the first directions in CAAT research. An overview of the process and basics of the annual audit was also provided. Second, an empirical study was performed to find answers to the research questions. Thus, the current challenges for auditors and the use of CAATs were examined and summarized. The results and insights obtained were then critically discussed, and the implications of the results in terms of theory, practice, and research perspectives were presented.

2. Theoretical framework and hypothesis development

2.1. Prior CAAT research

With the digital transition and automation that characterizes the 21st century, an increasing amount of data is accumulating that needs to be analyzed and evaluated. Digitization and the large volume of data are phenomena that are currently discussed among both researchers and practitioners globally. In this context, CAATs are increasingly important, as they enable auditors to efficiently process large amounts of data to form well-founded audit opinions. The adoption of CAATs is supported by the UTAUT, which identifies that performance expectations and enabling conditions are critical factors in the acceptance of these technologies. Auditors who recognize the benefits of CAAT, which include time-saving and increased accuracy, have been shown to be more likely to adopt these technologies. In addition, the effective use of CAATs requires strong management support and comprehensive training programs to build auditor skills and confidence. This is particularly relevant for the public sector, where CAATs can substantially improve the efficiency and transparency of public services. Therefore, raising awareness of the importance of IT training and education can improve the quality of public administration through the use of CAATs. Digital transformation requires an investment in technological infrastructure as well as the continuous training of specialists to meet the challenges of modern data processing and fully exploit the advantages of digitization.

The changes caused by the digital transition have an impact on all areas of activity. The auditing field faces challenges in terms of digitization and the processing of large volumes of data. Although assessing masses of data has been performed by auditors previously, the procedures and data have changed to become increasingly digital, causing auditors to employ

innovative techniques such as CAATs (Lestari et al., 2020; Atta et al., 2024). Therefore, the potential of electronic support for verification and verification implementation is expanded, as digital data can be analyzed and verified with the help of various digital tools (Zadorozhnyi et al., 2021; Boczko, 2024). However, independent auditors have limited budgets, which hinders the acquisition of new innovative techniques and the enhancement of staff training. Clients expect an efficient and effective audit at the lowest possible price; therefore, the financial resources of the auditor must be invested according to the needs and requirements of the market to effectively compete (Munoko et al., 2020; Ionescu et al., 2022; Nasrah et al., 2023; Saputra et al., 2024).

New global networks and the internet age allow for the availability of information anywhere at any time, and clients expect quick solutions and availability from the auditor. Moreover, the capital market demands the rapid provision of reliable and accurate annual financial statements (Mosteanu & Faccia, 2020; Fotoh & Lorentzon, 2023; Difalla et al., 2024).

To support these needs of clients and the capital market, the basic IT tool for auditors is the use of CAATs (Nasrah et al., 2023; Chen et al., 2024).

CAATs include both simple techniques and more advanced variants of innovative methods that offer auditors the ability to conduct fast and efficient data analyses (Astolfi, 2021; Deepal & Jayamaha, 2022; Agwupuye, 2023).

Digitization of the audit process brings both advantages and disadvantages. One basic advantage is that of time; while an auditor requires time to rest, CAATs can run 24/7. Disadvantages include the high cost and the issue of digital ethics in the accounting profession (Awuah et al., 2022). The auditor can now use technological tools and methods in the various audit phases and audit processes (Calderon & Gao, 2023) while ensuring that the completeness, correctness, and validity of the audit evidence remains uncompromised (Lutfi & Alqudah, 2023).

Another important aspect in the processing of digital data concerns the format of the information, which can be more qualitative, less qualitative, unstructured, semi-structured, or structured. Thus, the method by which the auditor obtains the information from the client is critical (Chatterjee et al., 2021). Structured data are easier to handle, whereas unstructured information can present a processing challenge for the auditor (Deepal & Jayamaha, 2022; Silalahi et al., 2022).

The use of new technologies is diverse and possible at every stage of the audit engagement. In each stage of verification, different CAATs can be used to make the audit process more efficient (Nasrah et al., 2023). COVID-19 brought a series of restrictions that required auditors to work effectively from a remote location. Thus, the digital infrastructure within audit firms, similar to that of other companies, has become vital. Along with this, data security is crucial, considering the information that is processed by auditors. Data protection and security, as well as ethical issues, should remain top priorities for the accounting profession (Munoko et al., 2020; Yumiba, 2024).

Finally, the gradation of digitization is influenced by elements such as information bases, information quality, information reliability, scheme scenery, infrastructure, communication channels, and work approaches, as well as the entire financial system. This raises the following questions: In what way are audit companies digitized? Is the infrastructure used optimally?

To find an answer to these questions, we used an UTAUT model that addresses the different influencing factors regarding the use of new technologies.

2.2. The Unified of Acceptance and Use of Technology (UTAUT)

The UTAUT is based on an extensive literature analysis by Venkatesh et al. (2003) and functions as a combination of the eight most prominent technology acceptance models. The authors intended to develop a unified model that was free of redundancies and empirically verified and integrated the central findings of the following eight theories:

- Theory of Reasoned Action (TRA) (Davis, 1989)
- Theory of Planned Behavior (TPB) (Ajzen, 1985, 1991)
- Technology Acceptance Model (TAM) (Davis et al., 1989; Davis, 1989; Venkatesh & Davis, 2000)
- Motivation Model (MM) (Davis et al., 1992)
- Combined TAM and TPB (C-TAM-TPB) (Taylor & Todd, 1995)
- Model of PC Utilization (MPCU) (Thompson et al., 1991)
- Innovation Diffusion Theory (IDT) (Moore & Benbasat, 1991)
- Social Cognitive Theory (SCT) (Compeau et al., 1999; Compeau & Higgins, 1995)

This theoretical framework is shown in Figure 1 (Venkatesh et al., 2003). The theory was proposed as an instrument to record the achievements of novel technologies to improve the understanding of the users. The UTAUT consists of six variables and four influencing elements that are evaluated based on a seven-point Likert scale, where 1 = strongly disagree and 7 = strongly agree (Venkatesh et al., 2003, Robinson et al., 2015).

The influencing elements that were part of the UTAUT survey in the demographics group were gender, age, experience, and voluntary use. Venkatesh et al. (2003) assumed that these elements can have both positive and negative influences on the respective elements of the theory.
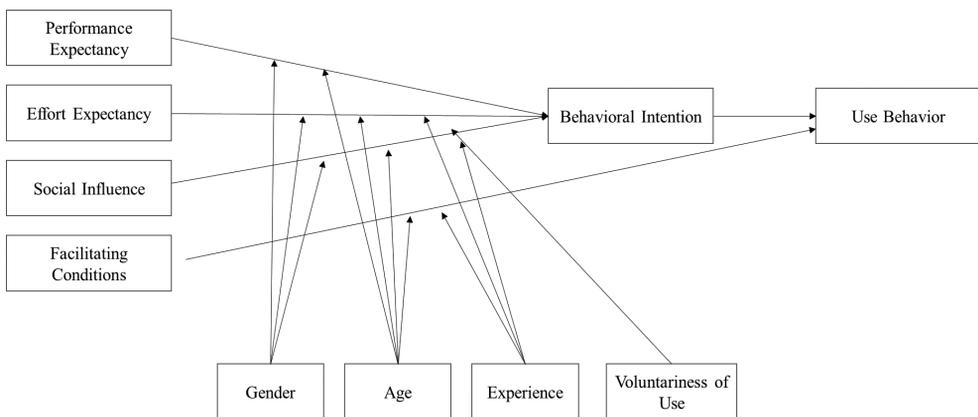

Figure 1. Unified Theory of Acceptance and Use of Technology (UTAUT) model (source: Venkatesh et al., 2003)

2.3. Performance expectancy

To maximize desire and performance, we must consider performance expectancy. Performance expectancy was described by Venkatesh et al. (2003) as the grade of confidence a person has in maximizing rewards using various tools. The use of CAATs can support auditors in their work to achieve the desired results in the shortest possible time based on the 24/7

activities conducted by the systems. Moreover, CAATs can provide a number of benefits that motivate the auditor to use and apply these new technologies, whereas if no benefits are evident, the technologies will be abandoned. Research from the specialized literature has emphasized the importance of using CAATs in audit activities, which is considered a predictor of the acceptance of new innovative technologies (Loraas & Wolfe, 2006; Bierstaker et al., 2014; Mansour, 2016). Technological advances in the field of auditing have been shown to improve the performance of auditors and accelerate audit processes (Mahzan & Lymer, 2014; Shihab et al., 2017; Al-Hiyari et al., 2019; Khalil & Olfa, 2020). Performance expectancy is a construct of the UTAUT structure, and based on previous research (Loraas & Wolfe, 2006; Bierstaker et al., 2014; Mahzan & Lymer, 2014; Mansour, 2016; Shihab et al., 2017; Al-Hiyari et al., 2019; Khalil & Olfa, 2020; Atta et al., 2024), we expect the performance expectancy variable to influence auditors to employ CAATs.

H1. Performance expectancy positively influences the use of CAATs in the audit process.

2.4. Effort expectancy

Effort expectancy was defined by Venkatesh et al. (2003) as the grade of comfort provided when using the tools. New technologies require a series of IT provisions, and auditors who are not familiar with these new technologies may be reluctant to purchase and use these digital technologies (Mahzan & Lymer, 2009). In contrast, IT-savvy auditors will be considerably more receptive to using CAATs (Siala Bouaziz & Jarboui, 2019). Curtis and Payne (2014), Shihab et al. (2017), and Siew et al. (2020) stated that effort expectancy affects behavioral intention because performance expectancy mediates the association between the two due to the financial pressures that can arise when implementing CAATs during the audit. However, other authors have reported that effort expectancy does not affect behavioral intention (Bierstaker et al., 2014). We note that opinions in the specialized literature differ regarding effort expectancy and its influence on behavioral intention even from the use of CAATs in audit activities. Thus, it is interesting to analyze the influence of effort expectancy on individual use and acceptance of digital technologies in practice within the UTAUT model (Venkatesh et al., 2003; Bierstaker et al., 2014; Pedrosa et al., 2015; Mansour, 2016; Handoko & Chu, 2021; Zakaria et al., 2024; Atta et al., 2024). Technological developments in recent years are increasingly motivating external auditors to use CAATs in audit engagements, which confirms that there is a positive trend in the use and adoption of CAATs in these engagements.

H2. Effort expectancy positively influences the use of CAATs in the audit process.

2.5. Social influence

Social influence was defined by Ventakesh et al. (2003) as the grade to which a person is influenced by the perceptions of others regarding the usefulness of new technologies. It is important to approach, encourage, and support managers in the use of CAATs by auditors. The grade by which auditors perceive that their line managers support the use of CAATs will influence whether they choose to adopt these methods (Loraas & Wolfe, 2006; Siew et al., 2020). In addition to support and motivation from managers, support and encouragement from colleagues can have a positive effect on the desire to use CAATs (Curtis & Payne, 2014; Bierstaker et al., 2014; Al-Hiyari et al., 2019; Calderon & Gao, 2023; Atta et al., 2024). The risks associated with the application of new technologies should not be ignored; however, these

risks can be minimized with adequate support from colleagues and management (Sirois et al., 2016; Khalil & Olfa, 2020; Handoko & Chu, 2021).

H3. Social influence positively affects the use of CAATs in the audit process.

2.6. Facilitating conditions

Facilitating conditions affect the level by which a person trusts that the structural and technical framework supports the use of novel digital technologies (Venkatesh et al., 2003). In the audit field, this constitutes providing support to the staff with the necessary infrastructure, in terms of appropriate CAAT resources and training to use these materials. According to the specialized literature, a positive correlation exists between facilitating conditions and the intent to use CAATs (Bierstaker et al., 2014; Pedrosa et al., 2020; Khalil & Olfa, 2020; Siew et al., 2020; Atta et al., 2024), whereas other researchers have claimed that the two factors are not associated.

Facilitating conditions play a critical role in the acceptance and use of CAATs by auditors. Studies have shown that the availability of technical and organizational resources is crucial for the implementation of these technologies. According to Venkatesh et al. (2003), these enabling conditions include the technical infrastructure and organizational support needed to support the use of CAATs. Mahzan and Lymer (2014) stated that managerial support and adequate IT facilities and training are essential to promote the acceptance and use of CAATs. Furthermore, Bierstaker et al. (2014) demonstrated that performance improvement expectations and availability of support resources were considerable predictors of CAAT use. Therefore, accounting firms should invest in technical infrastructure and training programs to increase the use of CAATs and improve the efficiency and effectiveness of their audits.

H4. Facilitating conditions positively influence the use of CAATs in the audit process.

Many digital technologies have recently been implemented in various fields and have shown positive effects on businesses, but the potential exists for substantial further expansion. Through these new technologies, verifications and certifications are simplified and access is available anytime and anywhere. The application and use of new technologies depend on the mindset of the user and the available infrastructure. Digital technologies are only useful if they are used and applied properly. The present research investigated the openness of financial auditors in Romania to the application and use of CAATs in their activities. No similar research was identified that investigated this subject in Romania; therefore, we identify this study as a new area of research.

3. Research methodology

Digital transformation has, and will continue to have, a considerable impact on the audit system. However, a holistic description of the influence of digitization on the audit profession in Romania is lacking. Thus, we considered it necessary to analyze the implications of digitization on the audit profession in Romania, particularly with regard to the use and application of CAATs.

The present research was based on the UTAUT model, which is a suitable method of testing the current state of use and application of CAATs in the auditing profession. We determined the dependent and independent variables for our empirical study based on the specialized literature presented in Table 1.

Table 1. Dependent and independent variables

Variable	Reference
Dependent variables	
Performance Expectancy (X1)	Venkatesh et al. (2003), Loraas and Wolfe (2006), Mahzan and Lymer (2009), Bierstaker et al. (2014), Mansour (2016), Al-Hiyari et al. (2019), Khalil and Olfa (2020), Abdul Ghani et al. (2022), Atta et al. (2024)
Effort Expectancy (X2)	Davis (1989), Venkatesh et al. (2003), Sayana (2003), Mahzan and Lymer (2009), Pedrosa and Costa (2012), Bierstaker et al. (2014), Pedrosa et al. (2015), Mansour (2016), Handoko and Chu (2021), Abdul Ghani et al. (2022), Atta et al. (2024)
Social Influence (X3)	Venkatesh et al. (2003), Loraas and Wolfe (2006), Mahzan and Lymer (2009), Bierstaker et al. (2014), Pedrosa et al. (2015), Khalil and Olfa (2020), Handoko and Chu (2021), Abdul Ghani et al. (2022), Atta et al. (2024)
Facilitating Conditions (X4)	Thompson et al. (1991), Venkatesh et al. (2003), Sayana (2003), Mahzan and Lymer (2014), Bierstaker et al. (2014), Pedrosa et al. (2020), Khalil and Olfa (2020), Abdul Ghani et al. (2022), Atta et al. (2024)
Independent Variable	
Behavioral Intention (Y)	Venkatesh et al. (2003), Mahzan and Lymer (2014), Bierstaker et al. (2014), Pedrosa et al. (2020), Khalil and Olfa (2020), Abdul Ghani et al. (2022)

Based on the research protocol of Busalim (2016), we created a questionnaire with two essential parts. The first part concerned demographic aspects and included 4 questions, while the second part involved the application of CAATs among the auditors and consisted of 18 questions. The respondents of this study were external auditors who worked in Romanian companies. The questionnaire was distributed online to obtain as many responses as possible between June and July 2023. The demographic questions in the survey were answered with a clear categorization of participants. The data scales and categories included: gender (male: 74 participants (66%), female: 38 participants (34%)); age (years) (20–25: 2 participants (2%), 26–30: 12 participants (11%), 31–35: 27 participants (24%), 36–40: 20 participants (18%), 41–45: 15 participants (13%), 46–50: 18 participants (16%), over 50: 18 participants (16%)); professional position (junior auditor: 86 participants (77%), senior auditor: 12 participants (11%), manager: 13 participants (12%), partner: 1 participant (1%)); and experience (less than 1 year: 2 participants (2%), 1–5 years: 9 participants (8%), 6–10 years: 38 participants (34%), 11–15 years: 27 participants (24%), more than 15 years: 36 participants (32%)). These scales provide a comprehensive overview of participant demographics and help facilitate the analysis and interpretation of the survey data.

The questions in the second part of the questionnaire were measured using a seven-point Likert scale, which is a common research tool that was used in the basic model presented by Venkatesh et al. (2003). This scale ranges from "1" (strongly disagree) to "7" (strongly agree). The decision to use this method was based on literature research and the use of validated scales to ensure the comparability of results. In this study, we adopted a quantitative approach to empirically validate the research model (Figure 2) using partial least squares (SEM/PLS) structural equation modeling (Hair et al., 2012; Ringle et al., 2012). This method is considered appropriate for validating measurement and causal models because PLS minimizes the residual variance of endogenous latent variables and can be applied to non-normal distributions (Hair et al., 2012). SEM/PLS includes

two phases of data analysis. The first phase validates the reliability and consistency of the measurement instruments (the measurement model), while the second phase analyzes the structural relationships between the latent variables and evaluates the significance of the proposed hypotheses (the structural model). To measure the theoretical dimensions, we used validated scales as the basis for building the questionnaire (Davis, 1989; Venkatesh et al., 2003; Pedrosa et al., 2015). The analysis model includes the 4 dependent, and 1 independent variable presented in Table 1. For the analysis, Smart PLS was used to present the structural equation model (Figure 2).
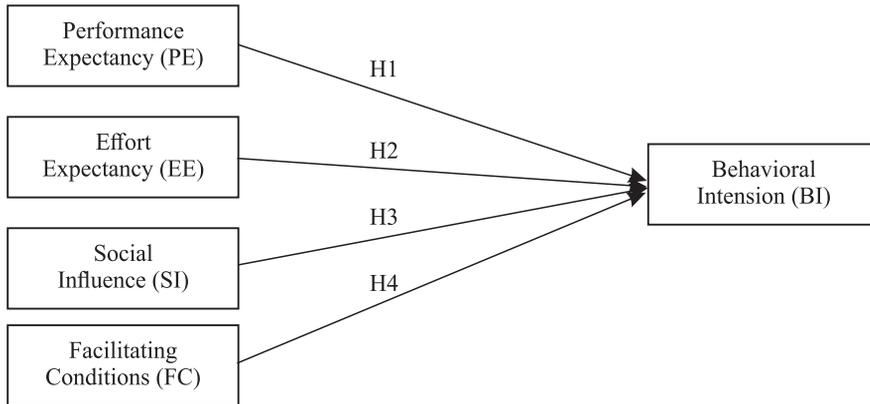

Figure 2. The proposed research model

To present and validate the hypotheses, we conducted a series of analyses: descriptive statistics, reliability tests, correlations, and a regression analysis.

The following linear model directed our multiple regression analysis:

$$BI = \beta_0 + \beta_1 PE + \beta_2 EE + \beta_3 FC + \beta_4 SI + \varepsilon, \qquad (1)$$

where: β_0–β_4 – Coefficients; *BI* – Total of intent regarding CAAT acceptance and practice; *PE* – Performance expectancy; *EE* – Effort expectancy; *FC* – Facilitating conditions; *SI* – Social influence; ε – Error term.

4. Research results

4.1. Demographic statistics of the respondents

The first descriptive analyses of the collected data were performed following the elimination of invalid questionnaires. Of the 133 questionnaires obtained, 21 were incomplete and eliminated and the remaining 112 valid questionnaires were included in the final analysis. Table 2 lists the demographic characteristics of the respondents. This information includes a number of important characteristics that can be useful in analyzing and discussing the results.

The sample consisted of 66% men and 34% women, which indicates that the auditing profession in Romania employs mainly men. Furthermore, the majority of respondents were under 40 years old, and this demographic is generally open to new technologies and has acquired IT knowledge during their studies.

Table 2. Demographic characteristics

Category	Description	Number of participants	Percent
Gender	Male	74	66%
	Female	38	34%
Age	20–25 years	2	2%
	26–30 years	12	11%
	31–35 years	27	24%
	36–40 years	20	18%
	41–45 years	15	13%
	46–50 years	18	16%
	>50 years	18	16%
Job Position	Junior Auditor	86	77%
	Senior auditor	12	11%
	Manager	13	12%
	Partner	1	1%
Work Experience	<1 year	2	2%
	1–5 years	9	8%
	6–10 years	38	34%
	11–15 years	27	24%
	>15 years	36	32%

4.2. Hypothesis analyses

In this section, we used hypothesis analyses to present the results of our research and determine whether an association existed between the UTAUT model and the use and application of CAATs by audit firms in Romania.

The results of an empirical analysis are only meaningful if measuring instruments are sufficiently accurate. This measurement accuracy is referred to as "reliability", which, along with "objectivity" and "validity", is one of the main quality criteria of quantitative research. For a comprehensive reliability test, various criteria must be considered at the indicator and construct level.

To conduct the exploratory factor analysis (EFA), we used the Kaiser–Meyer–Olkin (KMO) test and Bartlett's test of sphericity. The KMO test obtained a value of 0.657 which was greater than the 0.6 value needed for the EFA (Iskamto et al., 2020). Bartlett's test returned an X2 value of 523765 with a p-value of 0.000 which is significant for factorable data (Spoorthy et al., 2021). We then conducted a principal component analysis (PCA) with varimax rotation, and the communalities for the factors assessed ranged from 0.391 to 0.717, which were greater than the minimum accepted value of 0.3 (Zeynivandnezhad et al., 2019).

The reliability and validity of the data were assessed to ensure the adequacy of the model. The construct fit indices indicated that the model was appropriate, and the results are shown in Table 3.

The validation of the expressed hypotheses begins by testing the convergent validity of the latent elements included in the construct. The internal convergent validity test (Sarstedt et al., 2017, 2021) produced an external loading overhead of 0.70, which signifies that all indicators demonstrated reliability. The average variance extracted value (AVE) of each variable

was >0.50 (Sarstedt et al., 2017, 2021; Hair et al., 2017). The Fornell-Larcker criterion is met when the square root of the AVE of each latent variable exceeds the correlations with other variables (Fornell & Larcker, 1981; Hair et al., 2017). All values were within the limits found in the specialized literature; therefore, the discriminant validity was acceptable (Table 4).

Table 3. Fit indices

Indicator	Chi squared	GFI	AGFI	NFI	CFI	RMSEA
Recommended values	< 3.00	> 0.90	> 0.80	> 0.80	> 0.90	< 0.10
Values obtained	1.613	0.911	0.834	0.889	0.923	0.025

Table 4. Data validation

Variable	Factor loading	Average Variance Extracted (AVE)	Cronbach's Alpha	Composite Reliability
PE	0.789–0.921	0.693	0.874	0.912
EE	0.778–0.889	0.664	0.851	0.857
SI	0.814–0.878	0.711	0.892	0.915
FC	0.807–0.912	0.754	0.872	0.916
BI	0.849–0.893	0.767	0.874	0.918

The calculated factor loadings indicate the level of association between the items (Hair et al., 2014). Before performing factor analysis, the feasibility of the method must be determined based on the available data. A central assumption of factor analyses is that the structure of the data can be revealed by forming representative factors (Hair et al., 2014). Figure 3 shows the factor loading of each element and the path coefficient.
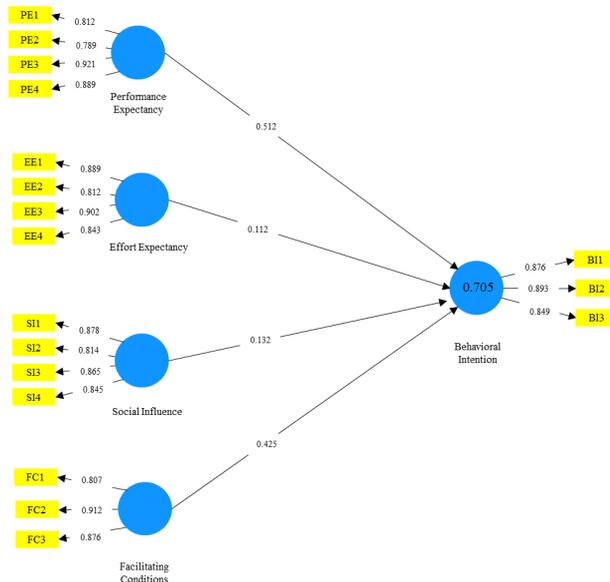

Figure 3. Validated research model

The intention of these tests was to determine the ability of the independent variable to explain the variation in the dependent variable. A value of zero value indicates a weak association between the independent and dependent variables, whereas a value of 1 signifies a strong connection between the two variables. According to Sarstedt et al. (2017, 2021) a value of 0.75 indicates that the model is robust, while a value of 0.5 denotes a moderate model, and a value of 0.25 signifies that the model is weak.

Table 5. R-Squared and R-Squared Adjusted Values

Variable Inflation Factor	Variable
	Behavioral Intention (Y)
R-Squared	0.705
R-Squared Adjusted	0.696

The adjusted R-squared value obtained was 0.696 for the behavioral intention construct (Table 5). Therefore, we conclude that our variables explained the construct of behavioral intention to the extent of 69.6%, and the difference of 30.4% was explained by the remaining variables.

Table 6 shows that the second and third hypotheses were rejected, whereas performance expectancy and facilitating conditions influenced behavioral intention to use CAATs in the audit profession.

Table 6. Hypothesis testing

Variable	Path coefficient	Standard Deviation (STDEV)	T-Value	P Value	Sig (0.05)	Decision
PE − BI	0.512	0.081	4.52	0.01	0.01	Accepted
EE − BI	0.112	0.093	1.27	0.225	0.07	Rejected
SI − BI	0.132	0.113	0.256	0.765	0.08	Rejected
FC − BI	0.425	0.121	6.21	0.00	0.00	Accepted

The results presented in Table 6 indicate that performance expectation positively affected the behavioral intention of auditors regarding the use of CAATs in the audit activity; therefore, the related hypothesis was accepted. In addition, facilitating conditions had a significant outcome on the behavior of auditors to use CAATs in their work, and hypothesis H4 was accepted based on the results obtained. As expected, and as the literature corroborates, effort expectation and social impact did not have a positive effect on the behavior intent to use CAATs.

5. Discussion

The present research was an empirical study analyzing the intention of financial auditors to apply and use new digital technologies in their work. Unlike other research in the specialized literature, this study was unique as it focused on auditors in Romania and offered a new perspective on the application and use of CAATs by auditors.

Performance expectations and facilitating conditions

Auditor performance expectations are based on the UTAUT, which suggests that the perceived benefits of a technology have a substantial impact on its acceptance and use. Therefore, auditors who believe that the use of CAATs improves their efficiency and quality of work are more willing to accept and use these technologies. Studies have shown that, compared to auditors who cannot recognize the benefits of CAATs, auditors who envision advantages such as the ability to efficiently analyze large amounts of data and form more accurate audit opinions, are more willing to use these technologies (Venkatesh et al., 2003; Bierstaker et al., 2014). These performance expectations drive the adoption of CAATs because they increase the effectiveness of audit processes and enable auditors to meet increased stakeholder demands. To further promote the use of CAATs, companies should invest in specific training programs and technical infrastructure to provide examiners with the necessary resources and knowledge.

Our research results can be useful to auditors, managers, and regulatory authorities, as well as educators who can adapt their curricula according to market needs (Ripoll-Soler & de-Miguel-Molina, 2019). The empirical results obtained here are in agreement with those of other researchers in this field. Specifically, the results indicate that performance expectations and facilitating conditions are the primary factors that positively influence the behavioral intention of auditors to accept and use CAATs in their work, which corroborates the findings in the specialized literature (Venkatesh et al., 2003; Bierstaker et al., 2014; Curtis & Payne, 2014; Mahzan & Lymer, 2014; Mansour, 2016; Sirois et al., 2016; Al-Hiyari et al., 2019; Atta et al., 2024).

Auditors who have experienced the usefulness of CAATs tend to continue using them and encourage others to exploit these innovative new technologies. The use of CAATs is directly related to the benefits they offer to the entity and its employees, the primary benefit being that of timesaving.

Based on the UTAUT, facilitating conditions are crucial for the acceptance and use of CAATs by auditors. These conditions include the availability of resources and the technical infrastructure necessary to support the use of these tools. Research has shown that auditors are more willing to use CAATs when they have access to a robust IT infrastructure and sufficient training opportunities (Venkatesh et al., 2003; Mahzan & Lymer, 2014). In addition, managerial support plays an essential role. If managers actively promote the use of CAATs and provide appropriate incentives, auditors are more willing to integrate these technologies into their work processes. Providing a user-friendly technical environment with ongoing support from IT experts allows auditors to readily familiarize themselves with the new tools and take full advantage of their benefits. Consequently, companies should invest not only in technological equipment but also in ongoing training and support of their employees to ensure the successful implementation and use of CAATs.

Employees are generally open to the use of new resources when offered by their employer. We noted that performance expectations and expediting circumstances are the main issues affecting the desire of auditors to consent and use CAATs (Mahzan & Lymer, 2014; Bierstaker et al., 2014; Mansour, 2016; Widuri et al., 2016). Therefore, technical and non-technical support from entities must be priorities to encourage the use of CAATs in audit work. The employer must provide the necessary technical infrastructure, implement training programs, and promote a corporate culture that supports the use of these technologies. Educational institutions can also benefit from these findings by adapting their curricula accordingly and

equipping future examiners with the skills and knowledge to use CAATs. Such adjustments would not only improve the individual performance of the auditors but also increase the overall quality of the audit.

Effort expectancy and social impact

The UTAUT defines auditor effort expectancy as the perception by the auditor of the difficulty of using CAATs. This expectation plays a considerable role in determining whether a technology will be adopted and used. According to the UTAUT, acceptance of CAATs depends largely on the interpretation of the auditor on the ease and intuitiveness of these technologies (Venkatesh et al., 2003). When auditors perceive CAATs as complicated and time-consuming, their willingness to integrate these technologies decreases. Studies have shown that young auditors with high IT affinities have lower effort expectations and are therefore more inclined to use CAATs (Curtis & Payne, 2014; Mahzan & Lymer, 2014). To minimize effort expectations, companies should invest in user-friendly software and provide comprehensive training programs to help auditors develop the necessary skills to increase their confidence in using CAATs. By reducing the perceived effort, companies can increase the adoption and effective use of these technologies.

Despite these findings, effort expectation and social impact did not have a substantial effect on behavior intent to use CAATs (Curtis & Payne, 2014; Mahzan & Lymer, 2014; Mansour, 2015; Kim & Gambino, 2016; Atta et al., 2024).

Social influence on auditors, as defined by the UTAUT, plays an important role in the acceptance and use of CAATs. Social influence factors include the perceptions of the auditor of the extent to which specific individuals or groups, such as superiors, peers, or professional networks, support and encourage the use of CAATs (Venkatesh et al., 2003). Studies have shown that pressure and support from management as well as acceptance within the peer group are crucial in determining whether auditors adopt new technologies (Mahzan & Lymer, 2014). When leaders actively advocate for the use of CAATs and provide positive examples, auditors are more likely to adopt these technologies. This is especially true in environments where the use of technology is mandatory. However, social influence may be less impactful in voluntary contexts because the individual preferences of the examiner are prioritized. To maximize social impact, companies should foster a culture that promotes the acceptance of CAATs through positive reinforcement, role models, and ongoing support from supervisors and peers. This can be achieved through regular training, workshops, and clear communication of the benefits and expectations of using CAATs.

The results regarding effort expectancy and social influence could have been affected by the age of the respondents. The majority of the participants were young people who had IT knowledge and were more open to using CAATs in their work. This emphasizes the necessity for managers to promote and encourage employees by offering CAAT training programs to remain competitive in the market despite the financial outlays required (Bierstaker et al., 2014). Venkatesh et al. (2003) stated that social impact has a positive effect on behavior intent in a mandatory setting only; this impact is minimal once the behavior becomes voluntary. Most auditors prefer to use technologies that are known to them and straightforward to use, and the transition to something new can be difficult if they cannot perceive the usefulness of the system. To increase the effort expectation in relation to the behavioral intention, an employer could introduce CAATs that are known to the employees or similar to those in place to create the perception that nothing new or unknown is being presented.

The results obtained in the present research indicate that audit firms are still at an early stage of digitalization and are taking small steps towards the integration of new technologies into their work. However, through appropriate infrastructure and training courses, the use of CAATs can be encouraged. A correlation with the academic curriculum would bring additional support to the profession in the application and use of CAATs. In addition, including training courses for interns and professional development sessions for professionals could encourage auditors to apply and use CAATs in their work.

Theoretical implications

The implications for researchers based on the UTAUT are complex and provide various areas of interest for future studies. The UTAUT identifies four main factors: performance expectations, effort expectations, social influences, and facilitating conditions that influence the acceptance and use of CAATs (Venkatesh et al., 2003). A thorough understanding of these factors is essential to promote the adoption and effective use of CAATs in auditing. Future studies could examine how specific training programs influence the performance expectations and perceived effort of the examinees, as well as the extent to which these programs increase CAAT usage in practice. Furthermore, the influence of social pressure and managerial support could be analyzed in different cultural and organizational contexts toward the development of tailored strategies to promote the use of CAATs.

Another important area of research is the study of enabling conditions, particularly technical infrastructure and ongoing IT support. It would be valuable to explore how investments in these areas influence the willingness of auditors to use CAATs. Finally, long-term studies could analyze the impact of CAAT use on the quality and efficiency of audit processes, auditor satisfaction level, and auditor professional development. Overall, the factors identified by the UTAUT provide a comprehensive basis for future research aimed at understanding and optimizing the challenges and opportunities of implementing CAATs in auditing.

Practical implications

The practical implications for auditors based on the UTAUT are extensive and affect many aspects of audit work. The UTAUT suggests that the acceptance and use of CAATs are shaped by performance expectations, effort expectations, social influences, and enabling conditions (Venkatesh et al., 2003). Practically, this means that auditors who recognize the benefits of CAATs in terms of efficiency and accuracy are more likely to use these tools, which results in higher-quality audit processes and an improved ability to identify risks and anomalies in financial data.

In addition, reducing the perceived effort through the implementation of user-friendly software and targeted training can increase adoption and facilitate the effective use of CAATs by auditors. Social influences, such as support from superiors and peers, can also play a crucial role. When auditors are encouraged to use new technologies, they are more likely to integrate CAATs into their work processes. Facilitating conditions, such as a well-developed IT infrastructure and continuous training opportunities, are also important. These factors enable auditors to use the technology efficiently to obtain the greatest benefit. Ultimately, by specifically promoting these factors, companies can increase the efficiency and effectiveness of their audit processes and enhance auditor satisfaction and engagement. Therefore, it is important to create a supportive environment to maximize the acceptance and use of CAATs.

Social implications

The social implications for auditors, based on the UTAUT, are considerable and influence both the methods by which auditors approach their work and the dynamics within accounting firms. According to the UTAUT, social influences such as the support of superiors, peers, and professional networks play an invaluable role in the acceptance and use of CAATs (Venkatesh et al., 2003). When peers and supervisors view CAATs positively and actively use them, auditors are more likely to adopt these technologies in their work.

These social influences can lead to greater community development within the organization as auditors collaborate and share knowledge about CAATs. This promotes a culture of continuous learning and improvement, which ultimately increases the quality of audit processes. In addition, the use of CAATs can help improve the professional status of examiners, as clients perceive them to be competent and up-to-date with the latest technology. Furthermore, management adoption and support of CAATs can help increase employee satisfaction as auditors feel that their work is valued and they have been trusted with access to the best tools available. A supportive company culture that encourages the use of CAATs can help reduce resistance to change and accelerate the adoption of new technologies. Overall, the social implications of the UTAUT show that a positive attitude and active support from associates are crucial for the successful implementation and use of CAATs. This highlights the importance of leaders and peers as role models who foster a culture of acceptance and technological advancement.

6. Conclusions

The present research aimed to analyze the application and use of CAATs in Romanian companies and outline future perspectives regarding the use of these tools in auditing. The current environment is continually transitioning, and the use of software-based examination techniques is essential to stay competitive. To cope with this, a multitude of possibilities and areas of application exists that can increase the efficiency of audit work using IT.

This study emphasized the importance of the digital transition in the audit field, which must process large volumes of data efficiently and effectively over a short period. We believe that this front-end research proficiently presented the application, use, regulation, and future perspectives of CAAT application in auditing. Although our analysis confirmed that the use and application of CAATs are essential in auditing, the potential exists for considerable further development and use of these tools. The relevance of CAATs is increasingly important in audit engagements due to economic changes and the desire to remain competitive in the market. Thus, audit companies must adapt to both market and client requirements. The imposed digital transition in the field of accounting that occurred with the emergence of COVID-19 caused the audit profession to adapt to new requirements, and similar adaptations will be required in audit techniques and methods in the future as the environment evolves.

Digitization is not new; it is part of everyday life, and examples of digitization can be found in various fields and processes. Digitization activities in the audit system cannot always be implemented seamlessly, and the digital transformation impacts different audit systems and employees in a distinct manner. Although advantages can be gained from the transition, challenges are inevitable, not all of which can be solved from within the system. Therefore, supports are required from a regulatory level. The qualifications of those involved in the examination system are closely related to the provision of technical resources. Training courses

must be implemented that are tailored to the needs of the individual target groups in the audit system with consideration of the human and material resources involved.

To conduct digital examinations, legal security regarding the ethical aspects encountered must be considered. Here the question arises, does it answer us for the results offered by CAATs? It is difficult to determine the responsible party for the results of various actions and the digital world is prone to cyber-attacks; therefore, preparation in anticipation of data compromise is critical.

The present research identified that common and regulated strategies regarding the application of CAATs are required in the audit field. In addition, further emphasis should be placed on education and the development of digital skills among employees to increase the desire to use new digital technologies. We believe that some minimum standards for digital skills should be identified that consider the degrees of digitization of the specific training practice.

Promoting and encouraging the application and use of CAATs should be a central aim of professional bodies to enable the establishment of modern and sustainable digital systems that provide greater efficiencies to auditors. Auditors are then allowed to focus on consulting and analyzing the data as opposed to the repetitive activities that can be performed by the systems.

The extension and detailed analysis of the application and use of CAATs and the impact of digital ethics in the audit profession can be considered new research perspectives. The use and application of CAATs should be analyzed in the different categories of audit firms, including the "Big 4", which have a competitive advantage over small and medium-sized firms as they possess greater financial resources to invest in new digital technologies.

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