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Adoption of Cloud Accounting Information Systems (CAIS) in Sarawak's Audit Firms

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Abstract

The purpose of this research is to examine the factors that influence the adoption of Cloud Accounting Information Systems (CAIS) among audit firms located in Sarawak. Previous literatures have highlighted unwillingness of Malaysian firms to implement CAIS due to lacking of government support, incongruence of accounting reporting system, and cybersecurity concerns. In audit industry, nearly half of the Millennials and Gen Z employees consider leaving their jobs due to inflexible work environments. Therefore, this study developed an extended DOI-TOE model which incorporated situational constraints (requisite skills and resources, organisational learning climate) and flexible working arrangement. This study was carried out using a quantitative approach. The survey questionnaires were distributed to employees of the Sarawak audit firms. To analyse the data, the Partial Least Squares-Structural Equation Model (PLS-SEM) was applied, enabling the investigation and testing of hypotheses. In total, number of respondents was 110. Among the factors examined, relative advantage, compatibility, IT resources, top management support, government support, supplier support was found to have positive relationship with adoption of CAIS, whereas security concern, cost saving, organisational learning climate, requisite skills and resources as well as flexible working arrangement negatively influence the decision to adopt CAIS. Despite CAIS has received minimal attention in the region, the research provides valuable insights, indicating a need for incentive programs and increased awareness to promote adoption. Future studies could explore alternative theoretical models and include a broader sample from across Malaysia for a comprehensive understanding of CAIS adoption.

Keywords: CAIS, Audit Firms, Extended DOI-TOE, PLS-SEM

Introduction

In today's rapidly evolving technological landscape, organisations have increasingly turned to various information technologies to enhance the efficiency of their operations (Sallehudin et al., 2020). The user-friendliness of IT tools, especially for executives transitioning from traditional methods to computerised systems has become crucial (Thottoli, 2021). In the service sector, including audit firms, the adoption of IT such as Accounting Information Systems (AIS) has become prevalent in improving business processes. AIS, a computerised system that gathers, processes, stores, and reports accounting information, has demonstrated its advantages, including safeguarding sensitive financial data and providing accurate financial reporting for stakeholders (Thottoli & Ahmed, 2021). Recognising the importance of a robust AIS, global enterprises have embraced it to achieve their business and strategic goals (Al-Okaily, 2021). AIS plays a pivotal role in transaction processing, ensuring high-quality information for managing operations, planning, regulation, monitoring, organization, and performance evaluation, consequently reducing costs and standardizing financial reporting (Huy & Phuc, 2020; Ibrahim, Ali, & Besar, 2020). Moreover, AIS

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enhances employee satisfaction, contributing to overall operational success (Ma, Lee, Teoh, & Ling, 2021).

The advent of Industry Revolution 4.0 (IR 4.0) has accelerated the automation and IT innovation, whereby cloud technology has emerged as a significant innovation. Cloud Accounting Information Systems (CAIS) have become critical tools for businesses, offering on-demand information accessibility via the internet (Gunanta, Hadian, Marwata, & Saudi, 2020). The adoption of CAIS is driven by several factors such as the benefits it brings to businesses, technological demand, regulatory requirements, and the influence of the younger generation (MIA, 2019). The use of CAIS in the accounting sector plays a crucial role in minimising data breaches and fraud, as well as enhancing audit quality and compliance (Thuan et al., 2022).

The accounting sector's transformation, driven by the use of automation and digital tools, has reshaped the roles of accountants and revenue streams for small enterprises. The adoption of software and subscription services has resulted in the optimisation of data collection, organisation, and tasks like bank reconciliation, hence impacting the efficiency of both large and small firms (AOB, 2021). The audit industry in Malaysia has witnessed notable changes, which are marked by a decrease in the number of audit firms and a simultaneous increase in the registration of individual auditors. The COVID-19 epidemic has accelerated the adoption of flexible work arrangements (FWAs), with 90% of Malaysian employees favouring location and schedule flexibility (Ernst & Young LLP, 2021). This transition motivates a need for a more in-depth examination of the employee's perspectives on adoption of CAIS. However, challenges associated with CAIS adoption, including the lack of government support and concerns about cyber-security, posing a need for further exploration (Awa & Ojiabo, 2016; Marston, Li, Bandyopadhyay, Zhang, & Ghalsasi, 2011).

This study extends the DOI-TOE model to include situational constraints such as required skills, resources, and the organisational learning climate, as well as the flexibility of working arrangements (Yoon, Ghosh, & Jeong, 2014; Pitt-Catsouphes & Matz-Costa, 2008). The research aims to bridge gaps in the literature regarding CAIS adoption in Sarawak and address inconsistencies in previous findings. By investigating factors influencing CAIS adoption in Sarawak's audit firms, the study seeks to provide valuable insights into the challenges and opportunities presented by CAIS adoption within the extended DOI-TOE framework. The overarching goal of this research is to comprehensively examine the factors influencing CAIS adoption rates among audit firms in Sarawak, shedding light on the complexity of this adoption process in a rapidly changing technological landscape.

Literature Review

Adoption Models

Diffusion of Innovations (DOI)

Rogers (1962) developed the theory of diffusion of innovations (hereafter DOI), a framework widely employed in studying IT adoption at both individual and organisational levels across various contexts (Salahshour Rad, Nilashi, & Mohamed Dahlan, 2018). DOI assesses IT adoption by focusing on two key parameters: innovation traits and firm innovativeness. This theory facilitated the evaluation of individual adoption rates and the innovativeness of organisations in relation to the adoption of IT. In conclusion, since DOI focused more on system features, organisational traits, and environmental variables, it has less explanatory power and is less practical for result prediction when compared to other adoption models (Taherdoost, 2018) if the researcher decided to sole used this framework.

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Adopting model of Technology-Organisation-Environment (TOE) Framework

Technology-Environment-Organisation framework (TOE) was developed by L. G. Tornatzky & M. Fleischer, (1990). The TOE framework's organisational environment contains attributes recognised by Tornatzky and Fleischer (1990) as drivers of technology adoption, such as formal and informal structures, communication procedures, size, and spare resources. Based on the TOE framework, three major factors influence CAIS adoption: technological, organisational, and environmental factors. TOE framework is one of the prominent theories used to investigate organisational IT adoption over the past two decades and is highly useful in forecasting company adoption behaviour when evaluating new technologies (Musa, Muhayiddin, Yusoff, Ismail, & Muhamad, 2019).

TOE was developed for the organisational adoption based on the Contingency Theory of Organisations. The concept states that an organisation should be congruent with its surrounds and environmental demands. The three key determinants that influence organisational adoption can be identified as technology, organisation, and environment. When making a decision, three influential variables must be considered: technological advancement, organisational circumstances, business and organisational re-configuration, and industrial environment (Bryan & Zuva, 2021).

The technological context within the TOE framework encompasses all technologies related to a firm's activities, both currently in use and those available in the market. While in the organisational context, the study should adopt the redundancy, willingness to adopt, and unclear policy to implement CAIS in the firm (Syed, 2017). Lastly, the environment drivers will be the external forces such as competitors, industry, and regulations are referred to as the environmental context (Sastararuji et al., 2022).

Cloud Technology in Audit Firms

The advent of CAIS has brought about a significant transformation in the field of accounting. The CAIS provide on-demand accounting services accessible from anywhere at any time (Sastararuji, Hoonsopon, Pitchayadol, & Chiwamit, 2022). The integration of cloud computing and accounting information system has significantly transformed accounting processes in term of efficiency and accessibility (Al-Nsour et al., 2021; Sastararuji et al., 2022). The COVID-19 pandemic has made it more crucial to examine how audit firms perceive the adoption of CAIS, as it can significantly impact the performance of these firms by offering them with competitive advantages, cost savings, enhanced accessibility and flexibility in decision-making, advanced security measures, and substantial time-saving benefits (Sibuea, Sinaga, & Muda, 2021; Habiba, Azhar, Annuar, & Mastora, 2019; Changchit & Chuchuen, 2018;; Tehrani, 2013). The accessibility CAIS's through internet-connected devices and robust security features ensure the confidentiality of financial data while simplifying and expediting traditionally labour-intensive accounting processes, making it a pivotal tool in modern accounting practices.

Technology

Relative Advantage

The relative advantage plays a crucial role in the adoption of Information Technology (IT) innovations due to its perceived benefits, such as efficiency, accessibility, speed, accuracy, and professionalism which leading to cost savings and increased profitability for businesses (Aziz & Wahid, 2020). When organisations really need to use new technology, they're more likely to adopt it. This makes the idea of "relative advantage" important in adopting new technology (Alshamaileh, 2013). Cloud computing, in particular offers numerous advantages, and organisations that view it favourably are more inclined to adopt it where it will enhance their service delivery capabilities (Sallehudin, Che Razak, Ismail, Md Fadzil,

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& Baker, 2018). Furthermore, small enterprises could reap the benefits of cloud computing, particularly immediate access to hardware resources and reduced upfront costs, which leading to shorter time-to-market for their products or services (Marston et al., 2011). Previous researches have consistently highlighted the significant role of relative advantage in technology adoption, especially in the field of IT (Sallehudin et al., 2020; Sallehudin et al., 2018). However, it's worth noting to study whether cloud computing adoption would bring relative advantage to SMEs as might not be a significant factor in their adoption decisions (Fook , Kim , Rayner, Tse, & Patricia, 2018).

H1: There is a positive relationship between Relative Advantage and CAIS adoption among Sarawak audit firms.

Compatibility

The premise of compatibility is crucial in the adoption of technology as it encompasses the alignment of new innovations with an organization's values, prior experiences and technological requirements (Amini, 2016). In the context of business, it is imperative to ensure that the technical and procedural aspects of innovations like CAIS align with an organisation's values and technology needs which is crucial with technological compatibility being particularly significant in fields like audit technology (Siew, Rosli, & Yeow, 2020). The effective adoption of CAIS necessitates the introduction of digital-enabled practices that compatible with an organisation's existing processes, especially relevant in the context of Malaysia's public sector, where prevalent technologies like Microsoft, Linux, Oracle, and Cisco are conducive for the adoption of innovations such as cloud computing (Sallehudin et al., 2020). Multiple studies highlight compatibility as a key determinant in the acceptance of IT innovations (Sastararuji, Hoonsopon, Pitchayadol, & Chiwamit, 2022; Abiodun et al., 2021; Sallehudin et al., 2020). Implementing CAIS requires meeting specific conditions, including a streamlined corporate structure, basic CAIS prerequisites (e.g., computer and internet access), and collaboration with audit firms that possess expertise in CAIS adoption (Sastararuji, Hoonsopon, Pitchayadol, & Chiwamit, 2022). Notably, compatibility has been identified as the most influential factor linking technological elements to cloud computing deployment within the Malaysian public sector, consistent with findings from prior research across various business sectors (Sallehudin et al., 2020).

H2: There is a positive relationship between Compatibility and CAIS adoption among Sarawak audit firms.

Security Concerns

The issue of security concerns pertains to incidents of security breaches and data compromises that occur during online activities. It has become increasingly significant due to the complexity of computer networks which posing potential barriers to the adoption of CAIS in organisation (Lutfi, 2022; Amini, 2016). Issues like data theft, malware, and cybercriminal activities are significant barriers to the adoption of CAIS online work, potentially hindering their integration. Insufficient identity management and security processes can contribute to reluctance in adopting cloud services (Asiaei & Nor, 2019). Research by Lutfi (2022) underscores that security concerns can limit adoption intent and inhibit IT adoption, consistent with prior technology adoption studies. Therefore, to promote CAIS adoption among Sarawak audit firms, it is essential for potential adopters to prioritize security concerns over the quality of sources and services during the initial decision-making

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process, and CAIS vendors should address these concerns, as demonstrated in previous studies.

H3: There is a negative relationship between Security concern and CAIS adoption among Sarawak audit firms.

Cost Savings

Cloud computing offers substantial cost savings for Small and Medium-sized Enterprises (SMEs) by reducing initial financial investments through on-demand access to software and hardware resources over the Internet, making it a compelling factor in technology adoption (Fook et al., 2018). These cost savings are crucial indicators of technological readiness and enable organisations to focus on core capabilities rather than infrastructure, enhancing efficiency and resource availability (Abiodun et al., 2021). Various studies, including research on IT adoption and Malaysian SMEs, have consistently highlighted cost reductions as a significant driver for the adoption of cloud computing, influencing the perceived advantages of adopting this technology (Abiodun et al., 2021; Sallehudin et al., 2020; Fook et al., 2018). Cost savings in cloud computing adoption have both direct and indirect impacts on its overall advantages.

H4: There is a positive relationship between Cost saving and CAIS adoption among Sarawak audit firms.

IT Resources

An organisation's willingness to embrace innovation, particularly for adopting CAIS, is strongly influenced by its IT resources, encompassing technology equipment, infrastructure, and the technical readiness of its employees (Fook, Kim, Rayner, Tse & Patricia, 2018). The technical infrastructure, including hardware, software, internet applications, and resources serves as the foundation for CAIS implementation with technology readiness acting as a critical determinant that can either facilitate or hinder innovation adoption (Hiran & Henten, 2020). Successful CAIS adoption requires employees to possess technological competence, encompassing digital technology knowledge and utilisation, with prior experience in digital technology enhancing expertise and utilisation (Sastararuji, Hoonsopon, Pitchayadol, & Chiwamit, 2022). Organisations demonstrating a high level of technology readiness are often well-integrated in terms of computerised processes and better positioned to embrace IT innovation, ultimately reaping greater benefits (Gangwar, Hema, & Ramaswamy, 2015). Prior research consistently underscores the role of IT resources in facilitating CAIS adoption, with organisations investing in specialised IT personnel and strategic initiatives being better equipped for cloud integration (Alharbi, Atkins, & Stanier, 2016; Alshamaila, Papagiannidis, & Li, 2013; Amini, 2016).

H5: There is a positive relationship between IT resources and CAIS adoption among Sarawak audit firms.

Top Management Support

Top management support which involves the assistance provided by senior-level management in the acceptance and implementation of innovative technologies plays a pivotal role in the adoption of cloud accounting and other information technology innovations within organisations (Eldalabeeh, Al-shbail, Almuiet, Baker, & E'leimat, 2021). Senior management is often closely involved in the decision-making process for technology adoption, from initiation and evaluation to software selection and acquisition,

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making their support a significant factor in technology adoption (Eldalabeeh et al., 2021). When top management recognises the potential benefits of cloud services, they are more likely to allocate the necessary resources and guide their staff in managing the organisational change required for successful implementation (Fook et al., 2018). Owner participation further ensures adequate resource commitment to technology implementation. Studies using the TOE (Technological, Organizational, and Environmental) framework consistently highlight the favourable and substantial influence of top management support on organizational technology adoption choices. Therefore, companies with strong senior management support are more inclined to incorporate CAIS software into their operations (Lutfi, 2022).

H6: There is a positive relationship between Top management support and CAIS adoption among Sarawak audit firms.

Government Support

Government support defined as assistance provided by governmental authorities to foster IT innovation, and its plays a pivotal role in influencing IT adoption within companies, particularly in Malaysia, where public sector bodies and central agencies establish regulations and processes for technology adoption, thereby encouraging the adoption of cutting-edge technologies and software (Thuan et al., 2022; Sallehudin et al., 2020; Amini, 2016). Government policies and initiatives like the PRIHATIN Economic Stimulus Package and the PENJANA Recovery Plan can significantly impact firms' decisions to adopt technologies like CAIS, leading SMEs to reconsider their business strategies and digitalisation efforts (Asiaei & Nor, 2019). Previous studies consistently highlight the importance of government support in technology adoption by enterprises, especially in emerging economies, and its positive influence on the adoption of CAIS further underscores its significance in shaping organizational technology decisions (Alshirah et al., 2021).

H7: There is a positive relationship between Government Support and CAIS adoption among Sarawak audit firms.

Supplier Support

The successful adoption of CAIS hinged on the crucial support provided by experienced suppliers who could offer advice, training workshops, and technical assistance to technology users, with supplier support being a significant determinant of inter-organizational system acceptance (Lutfi, 2022; Khayer, Talukder, Bao, & Hossain, 2020) . Beyond software and technology, cloud accounting providers offered specialized expertise, enhancing businesses' accounting knowledge and methods (Sastararuji, Hoonsopon, Pitchayadol, & Chiwamit, 2022). Supplier capabilities in utilising information technology strategies to encourage technology adoption were influential and businesses were more inclined to adopt technologies when supported by knowledgeable suppliers (Khayer et al., 2020). Service providers needed to offer comprehensive support, including training, marketing, technical customer care, and troubleshooting, and their marketing initiatives could significantly impact SMEs' adoption decisions (Alshamaileh, 2013). Support agreements, regular system testing, data integrity assurance, and 24-hour service centers further influenced organisations' decisions to adopt CAIS (Lutfi, 2022). Supplier support was especially crucial for small businesses lacking technical expertise and resources, encouraging their adoption and use of CAIS technology. Increased assistance from suppliers or cloud service providers positively influenced SMEs' adoption of cloud computing (Fook et al., 2018).

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H8: There is a positive relationship between Supplier support and CAIS adoption among Sarawak audit firms.

Requisite Skills & Resources

Skills, encompassing talent, knowledge, and training, are vital for the successful adoption and utilisation of new technologies, enhancing individual performance and productivity (Patacsil & Tablatin, 2017). When considering the adoption of a cloud accounting system, organisations must assess the complexity of the system and ensure that their employees possess the necessary knowledge and skills to effectively navigate it (Sobhan, 2019). The pace and extent of technology adoption in various institutions and countries depend on the nature of emerging technologies and the available human capital (Robinson, Siegel, & Liao, 2021). While new technologies emerge, slow productivity growth often results from the need for complementary skills or organisations' challenges in integrating new technology with their existing platforms (Robinson et al., 2021). Firms with a more educated workforce are more inclined to adopt new technologies (Brynjolfsson & McElheran, 2016). However, SMEs may hesitate to invest in skills development due to concerns about employees leaving after training, favouring recruitment of already skilled individuals (OECD, 2021). In a rapidly evolving digital landscape, employees need a range of skills, including information literacy, ICT proficiency, and technology and media literacy, to meet the demands of local and global markets (Nikou, De Reuver, & Mahboob Kanafi, 2022; Marsh, 2018; Kasemsap, 2017). Previous studies emphasize the significance of literacy and digital skills in technology adoption behaviour (Nikou et al., 2022; Yu, Lin, & Liao, 2017).

H9: There is a positive relationship between Requisite skills & resources and CAIS adoption among Sarawak audit firms.

Organisational Learning Climate

The organisational learning climate characterised by shared beliefs, attitudes, and conventions that promote learning, information exchange, and continuous development among employees, significantly influences technology adoption in businesses which enhancing their performance and outputs (Migdadi, 2021). Organisational learning encompasses investigation (seeking external knowledge) and utilisation (leveraging internal knowledge), and it serves as a crucial link in the business value chain, enabling organisations to acquire market knowledge, adapt to changes, and achieve flexibility (Chuks, 2022; Jiménez-Jiménez & Sanz-Valle, 2011). Previous research has shown that corporate learning capacity positively impacts turnover and earnings. For firms with limited internal knowledge, the exploratory approach to learning, involving knowledge acquisition from external sources, is a primary source of knowledge (Chan, Oerlemans, & Pretorius, 2011). In audit businesses, an organisational learning climate is critical for preserving audit quality, facilitating information exchange, supporting professional growth, and adapting to legislative changes, fostering development and continuous improvement (Migdadi, 2021). Overall, it creates a supportive environment valuing learning, knowledge exchange, and creativity, enabling businesses to thrive in a challenging business landscape (Khan & Khan, 2019). Furthermore, the organisational learning climate significantly influences organizational performance by promoting technological advancement (Awang, Sapie, Hussain, Ishak, & Yusof, 2019).

H10: There is a positive relationship between Organisational Learning Climate and CAIS adoption among Sarawak audit firms.

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Compressed Work Weeks

Flexible work arrangements (FWAs), including options like flexi-time, compressed work weeks, and flexi-location, offer employees the flexibility to balance work and personal life needs (Ciarniene & Vienazindiene, 2018). Compressed work weeks, in particular, provide employees with a day off each week while fulfilling mandatory working hours (Ewald & Hogg, 2022). These agreements aim to create mutually beneficial relationships between employers and workers, with CAIS enabling remote work and decision-making support (Al-Nsour, Weshah, & Dahiyat, 2021; Arquisola, Liswandi, Hutabarat, & Fauzi, 2022). In technology-dependent roles, FWAs often include quiet hours to disconnect from digital devices, enhancing work-life balance (Beigi, Shirmohammadi, & Stewart, 2018). Combining a reduced work week with CAIS can be particularly advantageous for millennials, increasing job satisfaction and reducing stress (Rivers, 2018; Webster, Sandra, 2018). Employers must support employees with necessary software, tools, and resources for FWA success (Atiku, Jeremiah, & Boateng, 2020). However, challenges like increased workloads may lead to stress and reduced leisure time (Alsulami, Mabrouk, & Bousrih, 2023). In sum, FWAs promote work-life balance and well-being but require organizational support to overcome potential drawbacks, ultimately creating a more enjoyable work environment.

H11: There is a positive relationship between compressed work weeks and CAIS adoption among Sarawak audit firms.

Research Methodology

The study's measurement scale is constructed by integrating the DOI-TOE model's theoretical foundation and insights from previous studies mentioned in our research hypotheses, and then it's tailored to suit the specific context. This research employs a quantitative approach. The quantitative scales employed in the research will gauge participants' perceptions using a seven-level Likert scale: 1-Strongly disagree; 2-Disagree: 3-Less disagree; 4-Neutral; 5-Less agree; 6-Agree; 7-Strongly agree. Since adopting of CAIS will affect the whole organisation, the respondent of the questionnaire will be the employees of the Sarawak audit firms. Questionnaires will be distributed by handing out surveys and online surveys for data gathering from employees in audit firms across Sarawak. The study also included of the location of the respondents where the location of the respondents was from Kuching 36 (32.7%), Sibu 55 (50%), Miri 13 (11.8%), and Bintulu 6 (5.5%). The minimum sample size of respondents will be determined using Raosoft calculator which will be minimum of 64 respondents. The research framework extends the DOI-TOE model to include situational constraints and the flexibility of working arrangements. Table 1 show the measurement items in the research questionnaire.

Data that been gather will be process using both SPSS and SmartPLS software to conduct PLS-SEM model analysis. PLS-SEM worked well when the model was complicated, with several latent variables and mediating factors, as well as when the sample size was small (Sarstedt, Ringle, & Hair, 2021). Additionally, PLS-SEM is particularly effective in handling causal modelling and is advantageous when dealing with relatively small sample sizes.

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Table 1: Constructs of Measurement Items

Variables	Questions
CAIS Adoption	CA1: I would recommend my colleagues to adopt CAIS.
	CA2: I would start using CAIS in regular basis in the future.
	CA3: I would like my organisation to adopt CAIS.
	CA4: CAIS is widely used in my organisation.
	CA5: CAIS could quickly be adopted to my organisation.
Relative advantage	RA1: CAIS enables us to accomplish tasks more quickly.
	RA2: CAIS would increase our productivity.
	RA3: CAIS could reduce our operational costs.
	RA4: CAIS would provide us with useful information for decision-making.
	RA5: CAIS would help us to access shared resources placed on cloud.
Compatibility	CB1: CAIS compatible with existing hardware and software in my company
	CB2: Using CAIS would fits well with the way we like to work.
	CB3: We believe that it is easy to get CAIS to get to the point.
	CB4: CAIS is compatible with all aspects of our work
	CB5: Customisation of CAIS is easy.
Security concern	SC1: It is safe and secure when dealing with the CAIS.
	SC2: My company offers a strong security system.
	SC3: My company has excellent equipment's
	SC4: I think CAIS operation is reliable
	SC5: Cloud providers' servers and data center are secure
Cost saving	CS1: CAIS would decrease expenditure
	CS2: CAIS reduce the investment in new hardware
	CS3: CAIS would reduce the cost of licensing new software
	CS4: CAIS would reduce the cost of upgrading the system
	CS5: CAIS would decrease the cost of system maintenance
IT resources	IR1: My company existing hardware support adoption of CAIS
	IR2: My company supports cloud computing.
	IR3: My company has full computer access for CAIS implementation.
	IR4: My company employs specialised and expert personnel to run CAIS.
	IR5: My company existing software support adoption of CAIS
Top management support	TMS1: There is constant support and encouragement from management towards the use of CAIS
	TMS2: There are assistance and resources provided by management to adopt CAIS
	TMS3: Top management concern with my happiness
	TMS4: Top management is likely to invest funds in cloud computing.
	TMS5: Top management is interested in using cloud computing for competitive advantage.
Government support	GS1: I believe Government support plays an important role in the use of CAIS
	GS2: I believe Government policies and regulations affect the use of CAIS
	GS3: I believe government provide technical training affect the use of CAIS
	GS4: Openness of company to change contributes to the adoption of CAIS.
	GS5: I believe Government financial assistance provides favourable environment for CAIS adoption.
Supplier support	SS1: It is necessary to have adequate technical support before CAIS adoption.
	SS2: I think it is necessary to have adequate technical support after CAIS adoption.
	SS3: I believe that a good relationship with supplier
	SS4: I believe strong access and identity management provide by supplier
	SS5: I believe cloud supplier have policy for handling personally identifiable information
Organisational learning climate	OLC1: Coaching and informal training of using CAIS are provided in the firm.
	OLC2: External experiences and ideas are valued as crucial assets for the firm's learning.
	OLC3: My company embrace risk and its consequences when venturing into new things.
	OLC4: My company provides new technologies at a fast rate.
	OLC5: My Companies' senior management is not opposed to change

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Required skills and resources	RS1: Having skills related to use new technologies is important for the success of my company RSR2: My company provides training to enhance skills related to new technologies RSR3: Time constraints limits my development skills RSR4: My company provides in-house training. RSR5: I have an access to resources such as equipment and manual to new technology.
Flexible Working Arrangement: Compressed work weeks	CWW1: My company is familiar with the flexible working arrangement CWW2: My company offers preferred starting and ending times for work CWW3: My company allows one day off per week CWW4: CAIS provides balance work-life in our company CWW5: My overall productivity increases due to flexible working arrangement

Source: Developed for research purpose

Data analysis and results

This study adopts a comprehensive analytical methodology by incorporating Partial Least Squares Structural Equation Modelling (PLS-SEM). The analysis is executed through a two-step process within PLS-SEM, encompassing measurement model validation and structural model hypotheses testing. The utilization of PLS-SEM underscores the study's commitment to a rigorous analytical framework, allowing for a systematic validation of measurement models and subsequent testing of structural hypotheses.

Table 2: Demographic profile of Respondents

		Frequency	Percent	Total
Age	18 – 24	22	20.0	
	25 – 35	57	51.8	
	36 – 45	16	14.5	
	46 – 55	12	10.9	
	56 and above	3	2.7	110
Gender	Male	23	20.9	
	Female	87	79.1	110
Education Level	Diploma	25	22.7	
	Bachelor Degree	73	66.4	
	Master	1	.9	
	Professional certificate	11	10.0	110
Location of the respondents	Sibu	55	50	
	Miri	13	11.8	
	Kuching	36	32.7	
	Bintulu	6	5.5	110

Source: (Authors, 2023)

The study encompassed 110 participants, comprising 20% males and 79% females, who actively engaged in a survey centred on Cloud accounting information systems. Demonstrating a robust methodology, the research employed a variance-based statistical analysis model known as Partial Least Square (PLS) Structural Equation Model (SEM) for hypothesis testing, utilizing SmartPLS V4 for data analysis .Notably, in the realm of business information systems research, PLS-SEM emerges as a preferred analytical approach for several reasons. It adeptly handles scenarios with limited sample sizes, bypasses the need for normality assumptions, and functions seamlessly without strict distributional assumptions, accommodating factors of nominal, ordinal, and interval scales.

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Furthermore, empirical evidence indicates the superiority of PLS-SEM over CB-SEM in discerning the authentic model, particularly focusing on elucidating variance in dependent variables (Sarstedt, Ringle, & Hair, 2021). This model choice is significant in the context of reflective or formative measurement models, as PLS excels in impartially examining data without bias from composite models.

Table 3: Measurement model analysis

Model Construct	Measurement Items	Loading	Composite reliability (CR[a])	AVE	Loading	CR[2]	AVE
		First iteration			Final iteration		
CAIS Adoption	CA1	0.899	0.889	0.657	0.899	0.889	0.657
	CA2	0.901			0.901		
	CA3	0.865			0.865		
	CA4	0.581			0.581		
	CA5	0.760			0.760		
RELATIVE ADVANTAGE	RA1	0.931	0.930	0.783	0.931	0.930	0.783
	RA2	0.930			0.930		
	RA3	0.842			0.842		
	RA4	0.877			0.877		
	RA5	0.840			0.840		
COMPATIBILITY	CB1	0.837	0.913	0.733	0.837	0.913	0.733
	CB2	0.874			0.874		
	CB3	0.906			0.906		
	CB4	0.875			0.875		
	CB5	0.786			0.786		
SECURITY CONCERN	SC1	0.828	0.878	0.647	0.828	0.878	0.647
	SC2	0.827			0.827		
	SC3	0.712			0.712		
	SC4	0.863			0.863		
	SC5	0.784			0.784		
COST SAVING	CS1	0.808	0.930	0.777	0.808	0.930	0.777
	CS2	0.878			0.878		
	CS3	0.905			0.905		
	CS4	0.909			0.909		
	CS5	0.903			0.903		
IT RESOURCES	IR1	0.919	0.856	0.657	0.919	0.917	0.784
	IR2	0.899			0.899		
	IR3	0.894			0.894		
	IR4	0.804			0.804		
	IR5	0.435			Omitted		
TOP MANAGEMENT SUPPORT							
	TMS1	0.887	0.932	0.774	0.887	0.932	0.774
	TMS2	0.867			0.867		
	TMS3	0.859			0.859		
	TMS4	0.900			0.900		
	TMS5	0.885			0.885		
GOVERNMENT SUPPORT	GS1	0.942	0.948	0.826	0.942	0.948	0.826
	GS2	0.942			0.942		
	GS3	0.905			0.905		
	GS4	0.842			0.842		
	GS5	0.910			0.910		
SUPPLIER SUPPORT							
	SS1	0.852	0.898	0.707	0.852	0.898	0.707
	SS2	0.855			0.855		

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	SS3	0.816			0.816		
	SS4	0.888			0.888		
	SS5	0.792			0.792		
ORGANISATIONAL LEARNING CLIMATE	OLC1	0.833	0.883	0.657	0.833	0.883	0.657
	OLC2	0.772			0.772		
	OLC3	0.868			0.868		
	OLC4	0.831			0.831		
	OLC5	0.743			0.743		
REQUIRED SKILLS AND RESOOURCES							
	RSR1	0.793	0.876	0.644	0.793	0.876	0.644
	RSR2	0.875			0.875		
	RSR3	0.753			0.753		
	RSR4	0.730			0.730		
	RSR5	0.853			0.853		
COMPRESSED WORK WEEKS	CWW1	0.791	0.895	0.633	0.791	0.895	0.633
	CWW2	0.743			0.743		
	CWW3	0.715			0.715		
	CWW4	0.827			0.827		
	CWW5	0.889			0.889		

Source: (Authors, 2023)
Notes: CA: CAIS adoption; RA: Relative Advantage; CB: Compatibility; SC: Security Concern; CS: Cost-Saving; IR: IT Resources; TMS: Top Management Support; GS: Government Support; SS: Supplier Support; OLC: Organisational Learning Climate; RSR: Required Skills and Resources; CWW: Compressed Work Weeks.

Ensuring the reliability and validity of a model is imperative in any research endeavour, and in the present study, a meticulous assessment of these facets was conducted through various approaches. The measurement model underwent a rigorous examination involving internal consistencies, convergent and discriminant validity, in accordance with established guidelines. The reliability analysis included scrutiny of Cronbach's reliability and internal consistencies, employing composite reliability for each latent factor, surpassing the threshold of 0.70 as recommended in the literature (Sarstedt et al., 2021). Adhering to the rule of thumb, item loadings exceeding 0.50 were deemed acceptable, with 0.70 or higher considered desirable. Items with loadings below 0.40, particularly item IR4 with a loading of 0.435, were conscientiously omitted to enhance the measurement model's reliability.

Similarly, the study adhered to established benchmarks for composite reliability (CR), with all constructs exhibiting CR values exceeding 0.7, aligning with best practices in the field. Internal reliability, assessed in lieu of Cronbach's α, consistently surpassed the 0.7 threshold, further reinforcing the robustness of the model (Sarstedt et al., 2021). Convergent validity, gauged through the average variance extracted (AVE), adhered to Fornell and Larcker's (1981) criterion, ensuring that all AVE values exceeded 0.5 for each construct in the study. Notably, the study heeded the caution against relying solely on cross-loadings for discriminant validity, adopting the Heterotrait-Monotrait (HTMT) criteria developed by Henseler et al. (HTMT values below 0.85), demonstrating a more robust assessment of discriminant validity in the context of Partial Least Squares Structural Equation Modeling (PLS-SEM). The meticulous adherence to these validation and reliability measures fortifies the credibility of the study's findings (Sarstedt et al., 2021).

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Table 4: Structural model analysis

Hypothesis	Relationship	Beta	P-Value	T-Value	f^2	VIF	Decision
H1	RELATIVE ADVANTAGE -> CAIS ADOPTION	0.646	0	8.318	0.556	3.377	supported
H2	COMPATIBILITY -> CAIS ADOPTION	0.183	0.017	2.125	0.043	3.505	Supported
H3	SECURITY CONCERN -> CAIS ADOPTION	-0.053	0.262	0.638	0.004	3.201	Not Supported
H4	COST SAVING -> CAIS ADOPTION	-0.103	0.054	1.607	0.024	1.955	Not Supported
H5	IT RESOURCES -> CAIS ADOPTION	0.264	0.061	1.543	0.103	3.040	Not Supported
H6	TOP MANAGEMENT SUPPORT -> CAIS ADOPTION	0.225	0.021	2.032	0.055	4.171	Supported
H7	GOVERNMENT SUPPORT -> CAIS ADOPTION	0.125	0.161	0.990	0.016	4.478	Not Supported
H8	SUPPLIER SUPPORT -> CAIS ADOPTION	0.123	0.157	1.008	0.015	4.690	Not Supported
H9	ORGANISATIONAL LEARNING CLIMATE -> CAIS ADOPTION	-0.083	0.239	0.710	0.008	3.894	Not Supported
H10	REQUIRED SKILLS AND RESOOURCES -> CAIS ADOPTION	-0.112	0.070	1.477	0.022	2.609	Not Supported
H11	COMPRESSED WORK WEEKS -> CAIS ADOPTION	-0.230	0.004	2.675	0.097	2.453	Supported

Notes: * $p < 0.05$; $T>1.645$ is significant
Source: (Authors, 2023)

Table 5: R2 values

	R2 values
CAIS Adoption	0.776

Source: (Authors, 2023)

To ascertain the reliability of the structural model, an assessment of potential collinearity issues was undertaken, a crucial step given the propensity for strong correlations among predictor constructs to bias point estimates and standard errors (Ali, Javed, & Danish, 2021). The evaluation involved calculating Variance Inflation Factor (VIF) values, a diagnostic tool for detecting biases in data arising from collinearity. A VIF values exceeds greater than 5, it indicates that there could be a collinearity issue between the variables. Notably, the VIF values in this structural equation model are all less than 5, ranging from 1.955 to 4.690. This suggests that there is no collinearity among the variables in the model (Ali et al., 2021). The adoption of Partial Least Squares Structural Equation Modeling (PLS-SEM) in information systems research was emphasized as a robust method

Moving forward, the study employed a bias-corrected bootstrap procedure with 5000 subsamples to scrutinize hypothesized relationships in the structural model. Significance of path coefficients was determined through T-tests using bootstrapping, with a 5% significance level. SmartPLS V4 facilitated both inner and outer model analyses, and threshold values for significance were established at 1.645 for a 5% significance level. Several relationships were found to be statistically significant, including four exogenous driver construct relationships (RA → CA, CB → CA, TMS → CA, CWW → CA) with

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corresponding T-values exceeding the significance threshold. Conversely, seven exogenous driver relationships were not statistically significant (SC → CA, CS → CA, IR → CA, GS → CA, SS → CA, OLC → CA, RSR → CA).

Furthermore, the study assessed the R2 values, a measure of the proportion of variance in the dependent variable explained by the model. The R2 represents the variance explained in each of the endogenous constructs and is a measure of the model's explanatory power. As a general guideline, R2 values of 0.75, 0.50, and 0.25 can be considered substantial, moderate, and weak, respectively, in many social science discipline. An R2 value of 0.776, as indicated in Table 5, suggested the variables explain 77.6 percent of the significance of CAIS adoption. The substantial R2 value aligns with the research objectives, although caution is advised against overly high R2 values, which may signify overfitting.

Discussion

The primary aim of the present study was to discern the prevalence of CAIS adoption among audit firms in Sarawak, concurrently investigating the influencing factors. The study employed an extended DOI-TOE framework model to derive insights into the adoption process. A comprehensive evaluation of eleven CAIS adoption factors was undertaken, contributing to a significant understanding of the adoption landscape. While not all hypotheses received support, the reliability tests affirmed the efficacy of the proposed constructs as robust measurement tools. Strikingly, the study's findings revealed that a substantial 90% of audit firms in Sarawak had not adopted CAIS, contrasting with only 9% that had embraced this technology. This trend aligns with prior research indicating a predominant reliance on minimal computer-based Accounting Information Systems (AIS) among Small and Medium Enterprises (SMEs) (Habiba, 2019). The outcomes of this study thus offer valuable insights into the current state of CAIS adoption within the audit firms of Sarawak, providing a foundation for further exploration and strategic interventions in enhancing technology adoption in this context.

The outcomes of the data analysis pertaining to hypotheses H3 and H4 did not align with expectations (H3, t-value = 0.638; H4, t-value = 0.054). Despite being recognized as significant factors in prior research on Information Systems (IS) adoption, specifically in the contexts of E-accounting (Thottoli, 2021), Big Data (Lutfi et al., 2022), and CAIS adoption (Asiaei & Nor, 2019), the present study found that both security (H3) and cost-saving (H4) factors exhibited a negative and statistically insignificant influence on the adoption of CAIS among audit firms in Sarawak. This unexpected outcome, denoted by Beta values of -0.053 (t-value = 0.638) for security concern and -0.103 (t-value = 0.054) for cost-saving, suggests that variations in security levels and potential cost reductions do not impact CAIS adoption in Sarawak's audit firms. It is noteworthy that the present study extends beyond traditional approaches by incorporating user perspectives alongside decision-maker opinions in assessing security concerns, distinguishing it from previous studies utilizing the Technology-Organization-Environment (TOE) model that primarily relied on decision-maker viewpoints. The study's alignment with Thottoli's (2021) findings regarding the insignificance of IT costs on E-accounting adoption reinforces the robustness of these observations. Furthermore, the study's focus on Sarawak audit firms, as opposed to SMEs in previous research, adds a distinctive dimension to the understanding of CAIS adoption determinants (Lutfi et al., 2022; Thottoli, 2021; Asiaei & Nor, 2019). These findings contribute to the evolving discourse on factors influencing the adoption of CAIS in specific organizational contexts.

The study revealed a notable positive and statistically significant influence of top management support on the adoption of CAIS among audit firms in Sarawak (Beta = 0.225,

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t-value = 2.032). This signifies the crucial role of top management support as a determinant in the decision-making process for CAIS adoption within audit firms. The findings suggest that a higher degree of top management support correlates with an increased likelihood of CAIS adoption, emphasizing the pivotal nature of leadership endorsement in driving technological integration. This aligns with the conclusions drawn in prior research studies by Eldalabeeh et al. (2021) and Thuan et al. (2022), affirming the significance of top management support in the organizational decision-making process concerning technology adoption.

Conversely, the study identified Information Technology (IT) resources as an insignificant factor in the context of CAIS adoption among audit firms in Sarawak (Beta = 0.264, t-value = 1.543). This unexpected result diverges from previous research where IT resources were often found to be a significant determinant (Fook et al., 2018; Sastararuji et al., 2022; Amini, 2016). In this study, the insignificance of IT resources under the extended DOI-TOE model indicates that the availability or scarcity of IT resources does not significantly impact the decision to adopt CAIS within audit firms. Instead, the study underscores the predominant importance of top management support as a critical factor shaping the CAIS adoption landscape in organizational contexts. These findings contribute to a deeper understanding of the specific determinants influencing CAIS adoption within the unique organizational setting of audit firms in Sarawak (Eldalabeeh et al., 2021; Thuan et al., 2022; Fook et al., 2018; Sastararuji et al., 2022; Amini, 2016).

In the current study, both government support and supplier support were found to be statistically insignificant in influencing the adoption of Computer-Aided Information Systems (CAIS) among audit firms in Sarawak (Beta = 0.125, t-value = 0.990; Beta = 0.123, t-value = 1.008). Consequently, hypotheses H7 and H8, does not support the impact of government and supplier support within the extended DOI-TOE framework. This suggests that, according to the present study, neither government support nor supplier support significantly influences the decision-making process of Sarawak audit firms with regards to CAIS adoption. This outcome appears contrary to the assertions of Alshirah et al. (2021), who highlighted the substantial dependence of emerging economies on government assistance to expedite Information Technology (IT) adoption. Lutfi et al. (2020) similarly underscored the relevance of government backing in technology adoption by enterprises. The current findings are consistent with a prior study on the behavioral intention of Small and Medium Enterprises (SMEs) towards the adoption of Accounting Information Systems (AIS) (Ma, S. Y., 2021). Importantly, these results strongly indicate that, within the specific context of Sarawak audit firms, both government and supplier support do not wield a significant influence when decisions are made regarding CAIS adoption. Additionally, the findings may underscore the potential impact of regional variations on technology adoption dynamics among audit firms in Sarawak, hinting at the need for a significant understanding of contextual factors in influencing such decisions (Alshirah et al., 2021; Lutfi et al., 2020; Ma, S. Y., 2021).

In the findings of the research study, both organizational learning climate and required skills and resources were identified as statistically insignificant factors, indicating a negative and non-significant influence on the adoption of CAIS among Sarawak audit firms (Beta = -0.230, t-value = 0.710; Beta = -0.112, t-value = 1.477). Consequently, hypotheses H9 and H10, positing the impact of organisational learning climate and required skills and resources within the extended DOI-TOE framework, were not supported. This implies that, in the specific context of Sarawak audit firms, both organisational learning climate and the possession of requisite skills and resources do not significantly influence decisions pertaining to CAIS adoption. This result diverges from previous studies, such as

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those by Awang et al. (2019) and Migdadi (2021), where these factors demonstrated a significant association with innovation.

Contrastingly, compressed work weeks emerged as a significant and negative factor in influencing CAIS adoption among Sarawak audit firms (Beta = -0.083, t-value = 2.675). This signifies that a compressed work week has a significant negative impact on CAIS adoption, suggesting that audit firms in Sarawak consider this factor in their decision-making process. This finding aligns with the notion that the adoption of CAIS facilitates remote work and decision support through software, a characteristic that is particularly relevant in the context of compressed work weeks (Al-Nsour et al., 2021). Additionally, the flexibility offered by a compressed work week allows millennials to work when they are most productive or motivated, thereby reducing stress and enhancing job satisfaction (Rivers, 2018; Webster, Sandra, 2018). Consequently, the study underscores the importance of considering organizational factors and work arrangements when evaluating the determinants of CAIS adoption within Sarawak audit firms, thereby contributing to the evolving discourse on technology adoption in organizational settings (Migdadi, 2021; Al-Nsour et al., 2021; Awang et al., 2019; Rivers, 2018; Webster, Sandra, 2018).

Conclusion

This paper explored the factors that impact the CAIS adoption among audit firms in Sarawak, and it's also revealing that a majority of these firms have not embraced CAIS. The study underscores the prevalent need for top management support in decision-making regarding the adoption of new technology. Given the relatively limited attention afforded to CAIS by academic and professional bodies in Sarawak, this research contributes valuable insights for both academicians and practitioners. The findings shed light on the current adoption status of CAIS among audit firms in the region. In conclusion, the study suggests that CAIS adoption in audit firms remains minimal, despite awareness of its benefits. The majority of audit firms struggle to grasp the importance of CAIS, indicating a need for incentive programs to encourage adoption and increased awareness about the technology's significance.

In summary, this research analysed eleven variables within the extended DOI-TOE framework to understand the intentions of audit firms toward CAIS adoption. Out of these, only four variables (relative advantage, compatibility, top management support, and compressed work weeks) were found to be statistically significant. However, other variables, such as security concern, cost saving, IT resources, organizational learning climate, required skills and resources, government support, and supplier support, which had demonstrated significance in previous studies, did not yield consistent results in this study. Future research in this domain could explore alternative theoretical models to further develop and investigate the behavioural intentions of audit firms. Expanding the scope to include audit firms from other states in Malaysia could offer a more comprehensive understanding of CAIS adoption across the country. Increasing the sample size and adopting a longitudinal approach in future research endeavours may enhance the depth and accuracy of findings in this context.

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