Journal of Information System and Technology Management
JISTM
EISSN: 0128-1666
Volume 11 Issue 43 (June 2026) PP 44-63

JOURNAL OF INFORMATION SYSTEM AND TECHNOLOGY MANAGEMENT (JISTM)
www.gaexcellence.com/jistm

THE EFFECTS OF INFORMATION TECHNOLOGY ON WORK EFFICIENCY AMONG PUBLIC AUDITORS IN MALAYSIA

Nur Ain Amirah Razali[1], Shazalina Mohamed Shuhidan[2]*, Mohamad Ridhuan Mat Dangi[3], Yunita Awang[4]

[1]Accountant General's Department of Malaysia, Putrajaya, Malaysia
amirahrazali97@yahoo.com https://orcid.org/0009-0008-2710-4316
[2]Faculty of Accountancy, UiTM Puncak Alam Campus, Selangor, Malaysia
shazalin@uitm.edu.my https://orcid.org/0009-0006-1833-5265
[3]Faculty of Accountancy, UiTM Puncak Alam Campus, Selangor, Malaysia
ridhuan@uitm.edu.my https://orcid.org/0000-0003-3042-873X
[4]Faculty of Accountancy, UiTM Dungun Campus, Terengganu, Malaysia
yunita@uitm.edu.my https://orcid.org/0000-0002-5737-5546
*Corresponding Author

Article Info:

Article history:
Received date: 10.03.2026
Revised date: 07.04.2026
Accepted date: 03.05.2026
Published date: 10.06.2026

To cite this document:

Razali, N. A. A., Shuhidan, S. M., Mat Dangi, M. R., & Awang, Y. (2026). The Effects of Information Technology on Work Efficiency Among Public Auditors in Malaysia. *Journal of Information System and Technology Management, 11* (43), 44-63.

Abstract:

The study aimed to explore the effects of Information Technology (IT) on work efficiency among public auditors in Malaysia. Key factors such as IT competency of the auditor, IT competency of the organization and auditors' attitudes towards the rapid changes in IT were examined by applying the Hertzberg's Two-Factor Theory and collecting a total number of 140 questionnaires from the public sector auditors at the National Audit Department (NAD) in Malaysia. The data was analysed by using statistical techniques including reliability test, normality test, descriptive analysis and Pearson's correlation analysis. The study provides significant results that indicate the effects of IT competency of the auditor, IT competency of the organization and auditors' attitudes towards the rapid changes in IT on the auditors' work efficiency would encourage auditors and organizations in the accounting industry to have a higher level of IT competency and adopt the current technologies. The study also highlights several IT benefits for a body of knowledge and future research in the accounting field.

Journal of Information System and Technology Management
JISTM
EISSN: 0128-1666
Volume 11 Issue 43 (June 2026) PP 44-63

DOI: 10.35631/JISTM.1143003 **Keyword:**

Auditors' Attitudes, Auditors' Work Efficiency, Information Technology, IT Competency, IT Competency of Organization.

Introduction

The rapid growth of Information Technology (IT) has increasingly influenced the daily activities of individuals, businesses and the government. Organizations increasingly adopt advanced IT systems in their operations to meet customer demands, improve efficiency, and enhance overall business performance. Beyond operational improvements, IT has become an integral component of accountancy and business practices, leading to an expansion in the roles and responsibilities of accounting professionals. Today, the majority of accounting practitioners are employed in commerce, industry, government, the public sector, and non-profit organizations. Through the adoption of contemporary technologies, these professionals are able to operate across a wide range of functional areas both within and beyond traditional finance and accounting roles (International Federation of Accountants [IFAC], 2019).

Among the most widely used IT systems in accounting and financial transactions are cloud-based services, which enable online data storage, and data analytics tools that support the calculation, presentation, and interpretation of financial information in a timely manner. Evidence of this growing technological adoption can be observed in a survey conducted by the Malaysian Institute of Accountants (MIA) in 2020, which reported a substantial increase in the use of data analytics tools among MIA members from 20% in 2017 to 43% in 2019. This trend demonstrates the growing recognition among accounting professionals that digital competency is no longer optional but essential for effective practice.

For auditors specifically, IT has fundamentally altered how audit engagements are conducted. Auditors now rely on specialized software for risk assessment, sampling, data analysis, and report generation. The COVID-19 pandemic further accelerated this digital transformation, as remote auditing became necessary and IT systems proved critical for maintaining audit quality despite physical constraints. This shift has intensified discussions about the IT competencies required for modern audit practice and their impact on audit efficiency and effectiveness.

IT competency encompasses both technical knowledge of information systems and the practical ability to utilize technology effectively in professional contexts. For accounting professionals, this includes proficiency in current hardware and software, understanding of data security principles, and the adaptability to learn emerging technologies rapidly (Thanitthanakhun & Jitsakul, 2025). Wessels (2008) emphasized that IT competencies are imperative for accountants to perform their tasks efficiently in technology-driven

environments. Without adequate IT skills, even experienced auditors may struggle to meet the productivity standards and quality expectations of contemporary audit practice.

However, IT competency extends beyond individual capabilities to encompass organizational factors. Organizations must provide appropriate IT infrastructure, training opportunities, and technological support to enable their employees to work efficiently (Tippins & Sohi, 2003). The interplay between individual auditor competencies, organizational IT support, and attitudes toward technological change creates a complex dynamic that influences overall work efficiency. Despite the acknowledged importance of IT in auditing, empirical research examining the specific relationships between IT-related factors and auditor work efficiency in the Malaysian public sector remains limited. Although previous studies have explored IT adoption in accounting generally, few have focused specifically on public sector auditors or examined multiple dimensions of IT competency simultaneously. The National Audit Department (NAD) of Malaysia, which conducts audits of government agencies and public entities, represents a particularly important context for such research given its role in public accountability and governance.

Although the rapid digitalization of auditing, there remains limited empirical evidence on how IT-related competencies and auditors' attitudes jointly influence work efficiency in the public sector, particularly within emerging economies such as Malaysia. Existing studies largely focus on IT-audit adoption in developed countries, offering limited insight into its impact on work efficiency in developing contexts. Moreover, few comprehensive structural models have examined how factors related to audit personnel and the workplace environment collectively influence audit quality.

This study is therefore important in identifying key determinants that enhance auditors' work efficiency, ensuring they possess the necessary IT competencies to effectively adopt emerging technologies in line with public sector digital transformation initiatives. Research on IT in auditing within the Malaysian public sector is also crucial in providing assurance regarding auditors' readiness and capability to utilize IT systems. By highlighting the impact of IT on audit efficiency, this study contributes to improving audit quality, strengthening transparency, and addressing public concerns regarding government spending. This study addresses this gap by investigating three key factors that may influence work efficiency among public auditors: (1) IT competency of individual auditors, (2) IT competency of the organization, and (3) auditors' attitudes toward rapid changes in IT. Drawing on Herzberg's Two-Factor Theory, this research examines how these factors relate to auditors' ability to complete audit tasks efficiently in terms of time, cost, and quality.

It is anticipated that the findings of this study contribute to both theoretical understanding and practical application. Theoretically, this study extends the application of Herzberg's motivation-hygiene theory to the technology adoption context within public sector auditing. Practically, the results could provide evidence-based guidance for audit organizations and professional development programs seeking to enhance auditor productivity through strategic IT investments and training initiatives.

Journal of Information System and Technology Management
JISTM
EISSN: 0128-1666
Volume 11 Issue 43 (June 2026) PP 44-63

Literature Review and Hypotheses Development

Theoretical Framework

This study employs Herzberg's Two-Factor Theory as its foundational lens for understanding how IT competency relates to work efficiency. Developed by psychologist Frederick Herzberg in the 1950s, this theory, also known as the motivation-hygiene theory, posits that employee motivation and satisfaction are influenced by two distinct sets of factors (Manny, 2014). Motivating factors (such as achievement, recognition, and personal growth) lead to satisfaction and motivate employees to perform at higher levels. Hygiene factors (such as working conditions, organizational policies, and technical competence) do not necessarily motivate when present but cause dissatisfaction and reduced performance when absent.

Herzberg's theory has received substantial empirical attention since its introduction, with research demonstrating its applicability across diverse occupational contexts and cultures. Studies have validated the theory's core propositions in settings ranging from manufacturing to professional services, including accounting and auditing (Hakami, 2024, Mohamed Saat, et al., 2021). The theory has proven valuable for understanding how workplace conditions influence professional performance in knowledge-intensive occupations where intrinsic motivation and technical competence are critical success factors (Galanakis & Peramatzis, 2022). In the context of information technology and technology adoption, researchers have applied Herzberg's framework to understand how technological factors influence employee motivation and performance. Several studies (Hakami, 2024; Nagalakshmi & Sai Sri Charan, 2024; Vijh et al., 2022) have demonstrated that IT-related capabilities and organizational support systems function primarily as hygiene factors in which their presence enables efficient work, while their absence creates frustration and inefficiency. This research have demonstrated the theory's relevance for understanding how technological and organizational factors shape employee experiences and outcomes in increasingly digitized work environments.

Hence, guided by this theory, individual IT competency could function as a hygiene factor because it represents a fundamental capability required for auditors to perform their work in IT related environments. When auditors lack adequate IT competency whether in the form of technical knowledge, practical skills, or adaptive capabilities, they may experience technological barriers that impede task completion, create frustration, and reduce motivation (Thottoli, 2021). These barriers manifest as difficulty using audit software, inability to leverage data analytics tools, inefficiency in document management, and challenges in communicating through digital platforms. Conversely, when auditors possess appropriate levels of IT competency, they can navigate technology-enabled work environments smoothly, completing tasks efficiently without technology-related impediments. However, this competency alone may not actively motivate superior performance, rather, it simply prevents the dissatisfaction and inefficiency that arise from technological inadequacy. The presence of IT competency enables baseline efficient performance by removing barriers, representing a necessary but potentially not sufficient condition for optimal work outcomes.

Work Efficiency in the Audit Context

Work efficiency, in its fundamental sense, refers to achieving desired outcomes while minimizing resource consumption, particularly time and cost (Ramachandran, 2023). In auditing, efficiency manifests as the ability to complete audit engagements in a timely manner

Journal of Information System and Technology Management
JISTM
EISSN: 0128-1666
Volume 11 Issue 43 (June 2026) PP 44-63

with optimal resource allocation while maintaining quality standards. However, as management theorist Peter Drucker noted, "efficiency is doing things right, while effectiveness is doing the right things." This distinction is critical in audit practice, where auditors must balance speed and cost-effectiveness with accuracy and compliance with auditing standards (Patel, 2021).

The integration of advanced IT systems into audit processes has created new opportunities for enhancing efficiency. For example, Kamil and Nashat (2017) identified several mechanisms through which IT improves audit efficiency. First, automated data processing systems enable auditors to obtain results from financial and non-financial information more rapidly than manual methods, allowing for faster error detection and immediate correction. Second, IT systems facilitate the analysis of large datasets to produce performance indicators and parameters, enabling efficient monitoring and evaluation. Third, advanced IT tools support sophisticated analytical methods, including statistical analysis, statistical sampling, and systems analysis, which enhance both the depth and presentation quality of audit reports.

Furthermore, IT systems provide instantaneous data retrieval capabilities, eliminating time-consuming manual searches through physical records. This integration of technology plays a critical role in supporting internal auditors by facilitating advanced data analytics and continuous evaluation of controls and risk exposures, which helps ensure that weaknesses are detected and addressed quickly (Eulerich et al. 2025). Many systems now incorporate pre-programmed audit procedures tailored to specific audit objectives, reducing the cognitive burden on auditors and standardizing audit processes (Hossain, 2025). Collectively, these technological capabilities suggest that IT adoption can significantly reduce the time and cost required to complete audit tasks while potentially improving audit quality.

IT Competency of the Individual Auditor

By adopting Herzberg's Two-Factor Theory, IT competency of the individual auditor can be identified as hygiene factor that causes dissatisfaction and reduced performance when absent. Auditor competency, especially in IT, is widely recognized as a critical factor in ensuring audit effectiveness and reliability. Auditors who possess an appropriate level of IT competencies would be able to perform their work more efficiently and avoid feeling any demotivation.

In addition, an individual with IT competency can help business organizations with the ideas and expertise related to the technology being used (Alsabahi et al., 2020). Prior research indicates that auditors who possess inadequate levels of IT competence can undermine their ability to evaluate complex information systems and digital records that would cause a detrimental outcome (Al-Duwaila & Abdullah, 2017; Hossain, 2025). A notable example is the collapse of the National Bank for Trade and Investment in Yemen, where auditors encountered significant challenges in accessing, interpreting, and analyzing client information systems due to insufficient IT knowledge. This deficiency resulted from the limited IT skills among auditors which have been linked to inaccurate audit reporting, providing a clean audit opinion instead of detecting fraudulent activities carried out by the bank's board of directors (Alsabahi & Ku Bahador, 2021). This case underscores the critical role of auditor competency in safeguarding audit quality and preventing material misstatements. Thus, there is a clear suggestion that the work performance of any individual is related to his or her level of competency and job motivation (Hamzah, Hussain & Rahim, 2019).

IT competency at the individual level encompasses the knowledge, skills, and personal characteristics that enable professionals to effectively utilize information technology in their work (Ni & Chen, 2016). Wang et al., (2015) conceptualized IT competency as a combination of IT related skills and knowledge that enhances employee performance. In the audit context, IT competent auditors possess both theoretical understanding of information systems and practical proficiency in applying technological tools to audit tasks.

The importance of individual IT competency has grown as auditors increasingly function as "knowledge workers" operating within technology-intensive environments (Maisurah, Bahador & Haider, 2012). These competencies enable auditors to leverage IT systems optimally, creating value for clients and improving overall business operations. Wessels (2008) argued that IT competencies are imperative for accountants to perform their duties efficiently in modern practice environments. This assertion is supported by evidence that professionals lacking adequate IT skills struggle to meet productivity expectations and deadlines in technology-dependent workflows.

Individual IT competency is not merely about technical proficiency; it also involves adaptability and continuous learning. Thanitthanakhun and Jitsakul (2025) noted, IT competent professionals must maintain current knowledge of hardware and software while demonstrating the ability to quickly learn and adapt to technological changes. This dynamic nature of IT competency reflects the rapid evolution of technology itself and suggests that ongoing professional development is essential for maintaining competency over time.

Research has consistently demonstrated positive relationships between individual IT competency and job performance across various professional contexts (Alsabahi, Bahador & Saat, 2020). In accounting specifically, IT competency enables professionals to contribute ideas and expertise related to technology use, enhancing both individual and organizational performance. Boritz and Carnaghan (2003) emphasized that competency extends beyond knowledge ("know-how") to include the ability to actually perform tasks ("do"), with competencies being inherently outcome-focused and performance-oriented. This perspective suggests that IT competency should be assessed not only by what auditors know about technology but by how effectively they apply that knowledge to achieve audit objectives. Auditors with higher levels of IT competency should be able to leverage technology more effectively, complete tasks more quickly, and maintain quality standards with less effort. The theoretical foundation suggests this relationship operates through the removal of barriers (hygiene factor), while empirical evidence demonstrates positive associations between competency and performance across contexts. Therefore, this study proposes:

H1: IT competency of the auditor has a positive significant relationship with auditors' work efficiency.

IT Competency of Organization

Although individual competency is crucial, organizational IT competency represents a distinct but complementary dimension. It refers to an organization's capacity to acquire, integrate, and utilize IT resources to achieve business objectives (Alsabahi et al., 2021). Meanwhile, Chen et al. (2024) stated that organizational IT competency relates to the collective capacity of an organization to effectively acquire, integrate, deploy, and strategically evolve its IT resources including personnel, processes, systems, and data to achieve its business objectives. From this

perspective, organizational IT competency encompasses not only technological infrastructure but also the policies, practices, and support systems that enable effective technology use.

Hence, guided by Herzberg's Two-Factor Theory, IT competency of organization can also be identified as hygiene factor since it includes the IT knowledge and IT supports provided to their employees, such as employee trainings to adopt the new IT systems available in the current industry. An organization should possess an appropriate level of IT competency to provide a supportive work environment for their employees to be able to perform their work more efficiently without being demotivated.

According to Ananda et al. (2023), organizations demonstrate IT competency through several mechanisms. Among others is the investment in robust IT infrastructure that provides employees with the tools necessary to perform their work efficiently. Some organizations may develop and maintain IT knowledge repositories that capture and disseminate best practices for technology use. Organization may also need to implement training and development programs that build employee capabilities and ensure that staff can utilize available technologies effectively.

The provision of IT training is critical for organizational IT competency. Ngugi (2014) found that training develops technology-related competencies among employees, enhancing their effectiveness in adopting new systems and applying advanced techniques. Training not only builds technical skills but also increases employee confidence and motivation, which in turn improves work performance. This is because the employees need to acquire data and skills to help them increase their work performance by applying relevant knowledge or techniques learned from the training to meet objectives of the company. By doing this, employees become more highly motivated and also have high level of confidence in performing their roles which lead them to be able to enhance their work performance. Santosh Kumar (2018) corroborated these findings, noting that IT training programs benefit both managers and employees by enhancing the ability to perform financial activities effectively.

However, organizational IT competency extends beyond simply providing technology and training. Organizations must also create environments that encourage technological adoption and use. This includes establishing clear expectations for technology use, providing ongoing technical support, and ensuring that IT systems are integrated into standard work processes rather than being treated as optional tools (Hakami, 2024). When organizations successfully integrate these elements, they create synergies between technological capabilities and human capital, ultimately enhancing organizational performance and competitive advantage.

Empirical evidence suggests that organizational IT competency should positively influence auditor work efficiency (Thanitthanakhun & Jitsakul, 2025). It means that organizations that provide adequate infrastructure, training, and support enable their auditors to work more efficiently by removing barriers to technology use. While individual competency enables auditors to use technology effectively, organizational competency ensures they have the resources and support necessary to do so. Based on this reasoning, this study hypothesizes:

H2: IT competency of the organization has a positive significant relationship with auditors' work efficiency.

Journal of Information System and Technology Management
JISTM
EISSN: 0128-1666
Volume 11 Issue 43 (June 2026) PP 44-63

The rapid pace of technological innovation has made adaptability as a vital competency for professionals in all fields, including auditing. Lai et al., (2021) observed that IT innovations in recent decades have fundamentally transformed workplace processes and business operations. For auditors, technological advances have automated many routine tasks, such as mathematical calculations and error detection, that previously required manual effort and significant time investment. This automation has reduced workload and allowed auditors to focus on higher-value analytical and judgmental tasks.

The COVID-19 pandemic provided a stark illustration of how technology enables flexibility and continuity in audit practice. During lockdowns and travel restrictions, auditors successfully conducted remote audits using digital collaboration tools, cloud-based document sharing, and video conferencing platforms (Wong & Berntzen, 2019). Since IT systems have become more advanced from time to time due to rapid innovation process that helps in mitigating the issues on working from home during the COVID-19 pandemic, it appears that employees with the attitudes to fully adopt the current technology will gain more benefits in using the current market trends. By using the new technologies in their work, they would be able to achieve personal growth in their career that can lead to satisfaction and motivate them to perform at higher levels. From the audit perspective, auditors would be able to collect and analyze the data on the current economic pattern in specific industry by utilizing the newest IT systems which further enhance their work efficiency.

In addition, Kucharska and Erickson (2019) also agreed that the utilization of current IT systems in delivering data and information in various digital platforms is a basic requirement in operating any modern organization since it would facilitate in creating new and relevant knowledge to the employees. Those auditors who had already embraced digital tools adapted more readily to remote work requirements, while those resistant to technology faced greater challenges (Morris et al., 2023). This experience highlighted the importance of not only possessing IT competence but also maintaining positive attitudes toward technological change. Therefore, auditors' attitudes towards the rapid changes in IT could function as both hygiene and motivator factors because it represents a fundamental element to drive auditors to adopt the latest technology to perform their work in IT-related environments.

Auditor attitudes toward technology influence both the adoption of new systems and the effectiveness with which those systems are used. Positive attitudes facilitate learning and experimentation with new tools, while negative attitudes or resistance can impede technology adoption even when systems are available (Handoko et al., 2023). Kucharska and Erickson (2019) suggested that effective utilization of IT systems for information delivery across digital platforms has become a fundamental requirement for modern organizations, as it facilitates knowledge creation and sharing. Having a positive attitude toward technological change enables auditors to continuously update their skills and adopt emerging tools, thereby maintaining and enhancing their work efficiency over time (Thanitthanakhun & Jitsakul, 2025).

Furthermore, technological adaptability influences the speed and quality of audit work. Grunwald and Achternbosch (2013) noted that early and effective engagement with new technologies allows professionals to provide faster and higher-quality services to clients. In the audit context, auditors who embrace new technologies can leverage advanced data analytics tools to identify patterns and anomalies more quickly, access real-time economic and industry

data to inform their assessments, and present findings in more compelling and accessible formats (Hossain, 2025; Thottoli, 2021).

Oztemel and Ozel (2019) positioned technological competency, which encompasses both skills and attitudes, as a primary element of individual competence. A systematic review by Leocádio et al., (2025) emphasized that technology serves as a key facilitator of knowledge management, enabling the capture, storage, and analysis of volumes of data beyond human capacity. As IT systems continue to evolve and become more sophisticated, auditors' attitudes toward these changes will increasingly determine their ability to maintain efficiency and effectiveness in their work. It is believed that auditors with positive attitudes are more likely to embrace new technologies, invest effort in learning new systems, and leverage technology effectively in their work. These attitudes facilitate both the adoption of efficiency-enhancing technologies and the effective use of those technologies once adopted. Therefore, this study proposes:

H3: Auditors' attitudes towards rapid changes in IT have a positive significant relationship with auditors' work efficiency.

Research Methodology

Research Design

This study employs quantitative research design using a cross-sectional survey approach to examine the relationships between IT-related factors and auditor work efficiency. A quantitative approach is appropriate as the study seeks to test hypothesized relationships between measurable variables and to produce generalizable findings. Cross-sectional design is appropriate for this study as it allows for the collection of data at a single point in time from a representative sample (Spector, 2019) of public sector auditors, enabling the examination of relationships between variables while maintaining efficiency in data collection.

Population and Sampling

The population for this study comprises 1,074 employees of Malaysia's National Audit Department (NAD) at both the federal and state levels, representing public auditors in Malaysia as previously identified by Ismail and Yuhanis (2019) at the time of this study. The NAD represents an appropriate research context for several reasons. First, it is the primary public sector audit institution in Malaysia, responsible for auditing government agencies and public entities. Second, the organization's public accountability mandate ensures that efficiency considerations are particularly salient within the organization.

A simple random sampling technique was employed to select respondents from the NAD population. This method ensures that every auditor in the population has an equal probability of selection, thereby minimizing selection bias and enhancing the generalizability of the sample. The use of simple random sampling is justified given the relatively homogeneous nature of the population, as all respondents share similar professional roles within the same organizational setting.

In terms of sample size determination, several scholars provide guidance on determining an appropriate sample size. For example, Singh (2006) recommends selecting 10–20 percent of the accessible population, while Mugenda and Mugenda (2003) suggest that for populations

Journal of Information System and Technology Management
JISTM
EISSN: 0128-1666
Volume 11 Issue 43 (June 2026) PP 44-63
under 10,000, 10–30 percent is adequate. Similarly, Kothari (2004) notes that a representative sample should include at least 10 percent of the population. Following these guidelines, a minimum sample of approximately 107 respondents was deemed sufficient. However, to enhance data reliability and account for incomplete or inaccurate responses, a total of 150 questionnaires were distributed via Google Forms. The additional responses allowed for replacement of any incomplete or erroneous submissions, ensuring a robust and representative dataset.

Research Measurement

Data was collected using a structured questionnaire divided into five sections (Parts A through E), each designed to measure specific aspects of the research variables. The questionnaire employed closed-ended questions to facilitate quantitative analysis and ensure consistency in responses across participants. The questionnaire utilized a five-point Likert scale for Parts B through E, ranging from 1 (strongly disagree) to 5 (strongly agree).

Items in part A collected background information on respondents, including gender, race, educational background, highest academic qualification, and possession of computer or IT-related certifications. These demographic variables provide context for understanding the sample characteristics.

In part B, the section measured individual IT competency by assessing respondents' levels of IT knowledge and skills. Items included proficiency in using specific IT and accounting software applications, ability to use advanced features (such as filters for data comparison and reliability assessment), and general computer literacy. This part identified whether the auditors who work in the public sector have an appropriate and sufficient level of IT knowledge and skills. Also, this part measured how auditors' level of IT competency would affect their performance or work efficiency.

Next, part C measured the level of IT support and awareness in an organization. Items in this section assessed the availability of IT infrastructure, provision of IT training programs, organizational awareness of technology adoption, and technical support systems. These items reflect the conceptualization of organizational IT competency, managing information technology and enabling effective use.

In part D, this section measured auditors' attitudes toward technological change by assessing their perceptions of technology adoption, confidence in using current technologies, openness to learning new systems, and experiences with adopting new IT tools. Items were designed to capture both affective orientations (positive or negative feelings toward technology) and behavioral tendencies (willingness to adopt and use new systems).

Meanwhile, part E measured work efficiency through items assessing respondents' ability to complete tasks in a timely manner, speed of task completion, quality of work produced, and overall job performance when using IT systems. These items operate efficiency as a combination of time savings, cost reduction, and quality maintenance. Hence, this part could identify whether the respondents had a high, moderate, or low level of work efficiency.

To ensure measurement quality, reliability analysis was conducted using Cronbach's alpha, with values above 0.70 indicating acceptable internal consistency.

Journal of Information System and Technology Management
JISTM
EISSN: 0128-1666
Volume 11 Issue 43 (June 2026) PP 44-63

Data Analysis Techniques

Collected data was analyzed using SPSS statistical software. Data analysis was conducted using statistical techniques aligned with the study's research objectives. Descriptive statistics were first employed to provide an overview of the levels of IT competency of Auditor, IT competency of organization, and Auditor's attitude towards changes in IT. Correlation analysis was then used to examine the strength and direction of relationships between the independent variables (IT competency of Auditor, IT competency of organization, and Auditor's attitude towards changes in IT) and the dependent variable (work efficiency). These analytical methods were selected to directly address the study's objective of exploring the effects of IT on work efficiency among public auditors in Malaysia.

Results and Discussion

Descriptive Analysis

Out of the 150 questionnaires distributed via email using Google Forms, 140 usable responses were received, representing a response rate of 93.3%. Descriptive statistics, including frequencies, means, and standard deviations, were calculated to summarize sample characteristics and variable distributions. Mean values were interpreted using Wiersma's (2000) scale, where means of 1.00-2.49 indicate low levels, 2.50-3.49 indicate moderate levels, and 3.50-5.00 indicate high levels.

The result in table 1 presents the descriptive statistics for all three independent variables and the dependent variable. The mean scores range from 3.2529 to 4.0186, all falling within the "high level" range according to Wiersma's (2000) classification (3.50-5.00), with one exception. The results indicate that the respondents generally report high levels of positive attitudes toward rapid changes in IT (M = 4.0186, SD = 0.5482), followed by high perceptions of their own work efficiency (M = 3.8745, SD = 0.5891). Individual IT competency (M = 3.4471, SD = 0.6234) falls in the moderate-to-high range, while organizational IT competency (M = 3.2529, SD = 0.7156) shows the lowest mean score, falling in the moderate range.

These findings suggest several important patterns. First, auditors demonstrate strong openness to technological change, which may reflect the organization's emphasis on modernization and digital transformation. Second, despite relatively moderate perceptions of organizational IT support, auditors still report high work efficiency, suggesting that individual competency and positive attitudes may partially compensate for organizational limitations. Third, the higher standard deviation for organizational IT competency (0.7156) compared to attitudes (0.5482) indicates greater variability in how auditors perceive organizational support, possibly reflecting differences in experiences across audit firms.

Table 1: Descriptive Statistics

Variable Items	N of Items	Mean	Std. Deviation
IV1	140	3.4471	0.72751
IV2	140	3.2529	0.73264
IV3	140	4.0186	0.60781
Valid N (listwise)	140		

Note: IV1 = IT competency of Auditor; IV2 = IT competency of organization; IV3 = Auditor's attitude towards changes in IT

Reliability Analysis

Cronbach's Alpha coefficients were calculated for each multi-item variable to assess internal consistency reliability. Cronbach's Alpha values of 0.70 or higher are generally considered acceptable for research purposes (Sekaran & Bougie, 2016), indicating that items within each scale consistently measure the same underlying construct.

Table 2 presents the Cronbach's Alpha coefficients for all variables. All values exceed the acceptable threshold of 0.70, indicating good internal consistency reliability. These reliability coefficients confirm that the items within each scale consistently measure their intended constructs. All scales demonstrate good to excellent reliability, supporting the validity of the measurement instrument.

Table 2: Reliability Analysis

Variable Items	N of Items	Cronbach's Alpha
Skills (IV1)	5	0.826
Supports (IV2)	5	0.925
Attitudes (IV3)	5	0.860

Note: IV1 = IT competency of Auditor; IV2 = IT competency of organization; IV3 = Auditor's attitude towards changes in IT

Normality Test

The normality of data distribution was assessed using multiple methods including, visual inspection of histograms and Q-Q plots; skewness and kurtosis statistics, and Kolmogorov-Smirnov and Shapiro-Wilk tests of normality (Gupta et al., 2019). These tests determine whether the data meets the assumptions required for parametric statistical tests.

The normality of the data was assessed using skewness and kurtosis values for each variable, as presented in Table 3. According to Kline (2005), skewness values within the range of -3 to +3 and kurtosis values within -10 to +10 are considered acceptable for normality. In this study, all variables fell well within these ranges. The negative skewness values observed for all variables indicate a slight tendency toward higher scores, which is consistent with the mean values reported in the descriptive statistics. Overall, the skewness and kurtosis results suggest that the data are approximately normally distributed, supporting the use of parametric statistical analyses.

Table 3: Skewness and Kurtosis

Variable Items	Skewness	Kurtosis
Skills (IV1)	-.037	-.358
Supports (IV2)	-.439	1.034
Attitudes (IV3)	-.093	-.318

Note: IV1 = IT competency of Auditor; IV2 = IT competency of organization; IV3 = Auditor's attitude towards changes in IT

Journal of Information System and Technology Management
JISTM
EISSN: 0128-1666
Volume 11 Issue 43 (June 2026) PP 44-63

Additionally, the normality of the data was assessed using the Kolmogorov-Smirnov and Shapiro-Wilk tests (Table 4). The results show that most variables had p-values less than 0.05, formally suggesting deviations from a perfect normal distribution. However, with a relatively large sample size (n = 140), these tests are highly sensitive, and minor deviations can lead to significant p-values. When considered together with the skewness and kurtosis values, which fall within acceptable ranges, the data can be considered approximately normally distributed. Therefore, the data is confirmed to be significant and has a linear relationship between the variables. These results satisfy one of the assumptions to conduct the next analysis, which is Pearson's correlation analysis that requires the existence of a linear relationship between two variables.

Table 4: Tests of Normality

Variable Items	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Skills (IV1)	.083	140	.019	.986	140	.151
Supports (IV2)	.115	140	.000	.958	140	.000
Attitudes (IV3)	.155	140	.000	.955	140	.000
Efficiency (DV)	.262	140	.000	.874	140	.000

a. Lilliefors Significance Correction

Pearson's Correlation Analysis

Pearson's correlation coefficients were calculated to examine the strength and direction of relationships between each independent variable and the dependent variable. The coefficients (r) were interpreted according to Mukaka (2012), where 0.00–0.30 indicates negligible correlation, 0.31–0.50 indicates low/weak correlation, 0.51–0.70 indicates moderate correlation, 0.71–0.90 indicates high correlation, and 0.91–1.00 indicates very high correlation. Statistical significance was assessed at the 0.01 level ($p < .01$) to ensure that observed relationships were unlikely to have occurred by chance.

The results in table 5 show that IT competency (Skills, IV1) has a positive and moderate relationship with work efficiency ($r = 0.552$, $p < 0.001$), indicating that auditors with higher levels of IT knowledge and skills tend to perform their tasks more efficiently. This finding supports H1.

In contrast, organizational IT support (Supports, IV2) demonstrates a positive but negligible relationship with work efficiency ($r = 0.242$, $p = 0.004$). Although statistically significant, the relatively low coefficient suggests that organizational support contributes to efficiency to a limited extent compared to other factors. This result supports H2.
Meanwhile, attitudes toward technological change (Attitudes, IV3) exhibit a positive and high relationship with work efficiency ($r = 0.786$, $p < 0.001$), indicating that auditors who are more open and adaptable to technological changes tend to achieve substantially higher efficiency in their work. This finding provides strong support for H3.

Overall, all independent variables are positively associated with auditors' efficiency. Among them, auditors' attitudes toward rapid IT changes show the strongest relationship, followed by IT competency of Auditor, while IT competency of organization has the weakest association.

Journal of Information System and Technology Management
JISTM
EISSN: 0128-1666
Volume 11 Issue 43 (June 2026) PP 44-63

This suggests that individual-level factors, particularly auditors' attitudes toward technology play a more critical role in influencing work efficiency than organizational support alone.

Table 5: Correlations

		Skills (IV1)	Supports (IV2)	Attitudes (IV3)	Efficiency (DV)
Skills (IV1)	Pearson Correlation	1	.365**	.678**	.552**
	Sig. (2-tailed)		.000	.000	.000
	N	140	140	140	140
Supports (IV2)	Pearson Correlation	.365**	1	.237**	.242**
	Sig. (2-tailed)	.000		.005	.004
	N	140	140	140	140
Attitudes (IV3)	Pearson Correlation	.678**	.237**	1	.786**
	Sig. (2-tailed)	.000	.005		.000
	N	140	140	140	140
Efficiency (DV)	Pearson Correlation	.552**	.242**	.786**	1
	Sig. (2-tailed)	.000	.004	.000	
	N	140	140	140	140

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

Discussion

This study examined the relationships between IT-related factors and work efficiency among 140 public sector auditors in Malaysia. All three hypothesized relationships were statistically significant, with auditors' attitudes toward technological change demonstrating the strongest association, followed by individual IT competency, while organizational IT competency showing the weakest relationship. These differential effects provide important theoretical and practical insights for understanding technology adoption and work performance in professional audit practice.

The findings strongly support Herzberg's Two-Factor Theory applied to the technology context. All three factors functioned as hygiene factors, with their presence enabling efficient work by removing technology-related barriers. However, the exceptionally strong correlation for attitudes ($r = 0.786$) suggests that this factor functions as both a hygiene factor and a motivator. Meaning that it can be a hybrid factor that both prevents dissatisfaction (when positive) and actively drives superior performance. This dual nature distinguishes attitudes from pure hygiene factors like individual and organizational competency, which primarily enable baseline performance without necessarily motivating exceptional outcomes.

The moderate positive relationship between individual IT competency and efficiency ($r = 0.552$) is consistent with prior research demonstrating positive associations between competency and performance (Alsabahi et al., 2020; Hamzah et al., 2019). This study extends previous findings by demonstrating that competency effects hold in public sector auditing contexts and that individual capabilities show stronger efficiency relationships than organizational support systems. The finding aligns with resource-based view perspectives emphasizing human capital as a source of competitive advantage (Chen et al., 2024).

The weak relationship between organizational IT competency and efficiency (r = 0.242), while statistically significant, contrasts with some prior research emphasizing organizational IT capabilities (Tippins & Sohi, 2003). Several factors may explain this pattern. First, the relatively low means for organizational IT competency (M = 3.2529) suggests perceived inadequacy in organizational support, likely to reflect resource constraints especially for smaller organizations that lack the financial and technological capacity to implement sophisticated auditing tools (Eulerich et al. 2025). Second, organizational competency may function more as an enabling condition rather than a direct driver, providing the infrastructure that individuals must actively leverage through their own competency and attitudes (Vijh et al., 2022). Third, high variability in organizational support (SD = 0.7156) across different firms may offset the overall relationship. These findings suggest organizational IT investments must be complemented by individual capability development and attitude cultivation to grasp their full potential.

On the other hand, the strong relationship between attitudes and efficiency (r = 0.786) strongly corroborates prior study (Handoko et al., 2023) emphasizing attitudinal constructs as primary determinants of technology adoption effectiveness. Auditors who embrace technological change are likely to experiment with new tools, proactively learn emerging systems, and continuously refine their methods. These behaviors move beyond mere compliance and contribute directly to enhanced efficiency. This result aligns with research by Kucharska and Erickson (2019), as well as Lai et al. (2021), who emphasized the critical role of attitudes in technology adoption and performance outcomes.

Conclusion

This study offers compelling empirical evidence that IT-related factors play a critical role in shaping auditors' work efficiency, with attitudinal factors exerting a markedly stronger influence than technical competencies. The findings not only reinforce the relevance of Herzberg's Two-Factor Theory in a technology-driven auditing context but also advance the theory by positioning attitudes as a hybrid construct that bridges motivational and capability dimensions. This theoretical refinement deepens our understanding of how psychological readiness interacts with technical proficiency in enhancing professional performance.

Looking ahead, future research should build on these findings by employing longitudinal designs, incorporating objective performance metrics, and extending analysis across diverse institutional contexts. Further exploration of mediating mechanisms and moderating variables will also enhance the robustness of the model. Overall, this study makes a meaningful contribution by demonstrating how individual competencies, organizational support, and attitudinal factors collectively drive efficiency in increasingly technology-intensive professional environments.

Practical implications

From a practical standpoint, the results provide clear strategic direction for audit institutions and policymakers. While continued investment in IT competency development and organizational infrastructure remains essential, greater emphasis should be placed on fostering positive attitudes toward technological change through targeted training, change management initiatives, and supportive organizational cultures. Such an approach is likely to yield more substantial and sustainable improvements in auditor performance.

Journal of Information System and Technology Management
JISTM
EISSN: 0128-1666
Volume 11 Issue 43 (June 2026) PP 44-63

The differential relationship strengths carry important practical implications for organizations seeking to enhance productivity through technology-related interventions. First, organizations should prioritize attitude development alongside traditional infrastructure and training investments. The strong attitude-efficiency relationship suggests that change management initiatives such as leadership communication emphasizing technology benefits, peer champions modeling positive attitudes, success storytelling, early involvement in technology decisions, and creating cultures of innovation, may deliver greater efficiency gains than infrastructure investments alone (Thanitthanakhun & Jitsakul, 2025; Thottoli, 2021). Such initiatives require primarily commitment and time rather than substantial capital, making them particularly feasible for resource-constrained public sector organizations.

Second, competency development initiatives should be strategic rather than generic. Training should emphasize application and practice over conceptual knowledge, target specific competencies required for audit roles, and incorporate continuous learning infrastructures including mentoring and regular updates. Continuous professional development programs should ensure auditors remain proficient in evolving audit technologies.

Third, organizations should invest more in IT should be strategic and complemented by individual-level interventions. While adequate infrastructure remains necessary, beyond threshold levels additional investments may yield diminishing returns unless accompanied by competency development and attitude cultivation. Organizations should focus on reducing variability in support across locations, ensuring alignment between organizational investments and auditor needs, and enabling collaborative platforms for knowledge sharing rather than purely individual productivity tools.

Fourth, effective technology adoption requires integrated approaches addressing attitudes, individual competency, and organizational support simultaneously rather than as separate initiatives. Comprehensive frameworks should incorporate change management capabilities as core organizational competencies, regularly assess the strength and weaknesses of individual and organization, and allocate sufficient resources as the foundation to support individual capabilities.

Limitations

Several limitations of this study should be acknowledged. First, cross-sectional design limits the ability to draw causal conclusions. Although the findings indicate significant associations, it cannot be determined whether IT competency and positive attitudes lead to greater efficiency or whether more efficient auditors are more likely to develop stronger competencies and favorable attitudes. Therefore, longitudinal or experimental research is needed to clarify causal directions.

Second, the focus on public sector auditors restricts the generalizability of the results. Hence, future studies should include auditing environments in the private sector or in different national contexts that may involve distinct regulatory pressures, resource constraints, and organizational cultures that could influence the relationships observed in this study.

Finally, the analysis did not account for several potentially relevant variables, such as auditor experience, workload, client characteristics, or audit complexity. These factors may partially

explain the reported associations. More comprehensive models that control for such covariates would help clarify the independent contribution of IT-related factors to audit efficiency.

Acknowledgements:	The authors would like to express their sincere gratitude to Faculty of Accountancy, Universiti Teknologi MARA cawangan Selangor for providing the necessary resources and support throughout the course of this research. Special appreciation is extended to colleagues and peers who contributed valuable insights and constructive feedback, which greatly enhanced the quality of this paper.
Funding Statement:	No Funding
Conflict of Interest Statement:	The authors declare that there is no conflict of interest regarding the publication of this paper. All authors have contributed to this work and approved the final version of the manuscript for submission to the International Journal of Information System and Technology Management (JISTM)
Ethics Statement:	This study was conducted in accordance with ethical research standards. Participation was voluntary, and respondents were assured of confidentiality and anonymity. The data collected was used solely for academic purposes.
Author Contribution Statement:	All authors contributed significantly to the development of this manuscript. Shazalina was responsible for the conceptualization, methodology, and overall supervision of the study. Nur Amirah handled data collection, analysis, and interpretation of results. Yunita contributed to the literature review. Mohamad Ridhuan was responsible for drafting, and critically revising the manuscript. All authors have read and approved the final version of the manuscript prior to submission.

Journal of Information System and Technology Management
JISTM
EISSN: 0128-1666
Volume 11 Issue 43 (June 2026) PP 44-63

References

Al-Duwaila, N., & Abdullah, A.-M. (2017). The opinion of auditors towards the importance and knowledge of information technology in Kuwait. *International Journal of Business and Management, 12*(3), 170. https://doi.org/10.5539/ijbm.v12n3p170

Alsabahi, M. A., Ku Bahador, K. M., & Saat, R. M. (2021). The influence of personal characteristics and workplace learning on information technology competency among external auditors: The role of organisational culture as a moderator. *International Journal of Information Systems in the Service Sector, 13*(2), 13-28 https://doi.org/10.4018/IJISSS.2021040102

Alsabahi, M. A., Bahador, K. M. K., & Saat, R. M. (2020). IT competency in accounting: A conceptual study. *International Journal of Business and Technopreneurship, 10*(1), 51-56. https://ijbt.unimap.edu.my/images/stories/IJBT%20FEB%202020/IJBT_Vol_10_Feb_2020_4_51-56.pdf

Ananda, R. H., Astuti, E. S., Wilopo (2023). Analysis of The Relationship of Information Technology Capability to Innovation and Organizational Performance (Meta-Analysis). Profit: *Jurnal Adminsitrasi Bisnis, 17*(1), 55-68. https://doi.org/10.21776/ub.profit.2023.017.01.6

Boritz, J. E., & Carnaghan, C. A. (2003). Competency-based education and assessment for the accounting profession: A critical review. *Accounting Perspectives, 2*(1), 7-42

Chen, C-H.S., Liu, G., Roushan, G. Nguyen, B. (2024) Exploring Information Technology Capabilities from Multiple Aspects of the Resource-Based Theory. *Information Systems Frontiers, 27,* 1013–1043. https://doi.org/10.1007/s10796-024-10490-1

Eulerich, M., Eulerich, A., & Bonrath, A., (2025). Technology and internal auditing: An overview of performance effects. *Maandblad voor Accountancy en Bedrijfseconomie 99*(4), 181–193. https://doi.org/10.5117/mab.99.153598

Galanakis, M., & Peramatzis, G., (2022). Herzberg's Motivation Theory in Workplace. *Psychology Research, 12*(1), 971-978. https://doi.org/10.17265/2159-5542/2022.12.009

Grunwald, A. & Achternbosch, M. (2013). Technology assessment and approaches to early engagement. In *Early Engagement and New Technologies: Opening up the Laboratory*, pp.15–34, Springer, Netherlands.

Gupta, A., Sahu, C., Keshr, A., Prabhaker M, & Chandra M. P. (2019). Descriptive Statistics and Normality Tests for Statistical Data Abstract. *Annals of Cardiac Anaesthesia, 20*(4), 456–458. https://doi.org/10.4103/aca.ACA_36_17

Hakami, T. A. (2024). The determinants of job satisfaction and auditors' performance in the Saudi context. *Journal of Money and Business, 4*(1), 18–37, https://doi.org/10.1108/JMB-07-2022-0038

Hamzah, M. F., Hussain, M. N. B. M., & Rahim, A. K. A. (2019). The competency effects towards the job performance of Islamic banking employees in Malaysia: Religiosity as a moderator. *Asia Proceedings of Social Sciences, 4*(3), 109–112.

Handoko, B., Lindawati, A., Sarjono, H., & Mustapha, M. (2023). Innovation diffusion and technology acceptance model in predicting auditor acceptance of metaverse technology. *Journal of System and Management Sciences, 13*(5), 443–456. https://doi.org/10.33168/JSMS.2023.0528

Hossain, S., (2025). The Impact of Emerging Technology on the Role of Auditors in Reshaping the Future of Audit. *European Journal of Accounting, Auditing and Finance Research, 13*(4), 37-58. https://doi.org/10.37745/ejaafr.2013

International Federation of Accountants (IFAC). (2017). Developing a future-ready profession: Sharing knowledge, ideas, and experience. Retrieved from https://www.iaasb.org/system/files/publications/files/Developing-a-Future-ReadyProfession.pdf

Ismail, S., & Yuhanis, N. (2019). Ethical work climate in the National Audit Department offices in Malaysia. *Management and Accounting Review (MAR), 18*(1), 57.

Kamil A and Nashat N (2017). The impact of information technology on the auditing profession analytical study. *International Review of Management and Business Research, 6*(4), 1330-1342.

Kline, R. B. (2005*). Principles and practice of structural equation modeling*. New York: The Gilford press.

Kothari, C.R. (2004) *Research Methodology: Methods and Techniques.* 2nd Edition, New Age International Publishers, New Delhi.

Kucharska, W., & Erickson, G. S. (2019). The influence of IT-competency dimensions on job satisfaction, knowledge sharing and performance across industries. *VINE Journal of Information and Knowledge Management Systems, 50*, 387–407.

Lai, H., Pitafi, A. H., Hasany, N., & Islam, T. (2021). Enhancing employee agility through information technology competency: An empirical study of China. *SAGE Open, 11*(2), 215824402110066.

Leocádio D., Malheiro L., Reis J.C.G.D. (2025), Auditors in the digital age: a systematic literature review. *Digital Transformation and Society, 4*(1), 5–20, https://doi.org/10.1108/DTS-02-2024-0014

Maisurah, K., Bahador, K., & Haider, A. (2012) Information Technology Skills and Competencies – A Case for Professional Accountants. *BIS (Workshops) LNBIP 127*, p. 81-87.

Manny-rosenfeld. (2014, December 23). Audit Efficiency and Effectiveness. Retrieved from https://fdocuments.in/amp/document/audit-efficiency-and-effectiveness.html

Mohamed Saat, M., Abdul Halim, N. S., & Rodzalan, S. A. (2021). Job satisfaction among auditors. *Advanced International Journal of Banking, Accounting, and Finance, 3*(7), 72-84. https://doi.org/10.35631/AIJBAF.37006

Morris, L., Hoitash, R., & Hoitash, U. (2023). The effectiveness and efficiency of auditors' remote work during COVID-19. *Auditing: A Journal of Practice & Theory, 42*(4), 223-245. https://doi.org/10.2308/AJPT-2022-019

Mugenda, O.M. and Mugenda, A.G. (2003) *Research Methods, Quantitative and Qualitative Approaches.* ACT, Nairobi.

Mukaka, M. (2012). A guide to appropriate use of Correlation coefficient in medical research. *Malawi Medical Journal, 24*(3), 69-71.

Nagalakshmi M.V.N. & Sai Sri Charan, Y.V.N. (2024). Herzberg's Two-Factor Theory and its application in hybrid work model - Evidence from India. *European Economic Letters (EEL), 14*(2), 3584–3595. https://www.eelet.org.uk/index.php/journal/article/view/1727

Ngugi, M. N. (2014). *Perceived relationship between training and development and employee performance in Geothermal Development Company (GDC)* [Doctoral dissertation, University of Nairobi]. University of Nairobi Digital Repository. uonbi.ac.ke

Ni, A. Y., & Chen, Y.-C. (2016). A Conceptual Model of Information Technology Competence for Public Managers: Designing Relevant MPA Curricula for Effective Public Service. *Journal of Public Affairs Education,* 193-212.

Oztemel, E. and Ozel, S. (2019). Technological competency assessment', *Int. J. Services Technology and Management, 25*(2), 138–159.

Patel. P. (2021). Efficacy, Effectiveness, and Efficiency, *National Journal of Community Medicine, 12*(2), 33-39

Ramachandran, K. K,. (2023). Optimizing it performance: a comprehensive analysis of resource efficiency. *International Journal of Marketing and Human Resource Management (IJMHRM), 14*(3), 12-29. https://iaeme.com/Home/article_id/IJMHRM_14_03_002

Santosh Kumar, C. S. & Kothari, H. (2018). Information Technology Competency of Bank Employees. *Pacific Academy of Higher Education Research 6*(2), 6-12 https://www.researchgate.net/publication/348714117_Information-Technology-Competency-Of-Bank-Employees.

Sekaran, U., & Bougie, R. (2016). Research Methods for Business. *Encyclopedia of Quality of Life and Well-Being Research,* 3336–3336. https://doi.org/10.1007/978-94-007-07535_102084

Singh, Y. K. (2006). *Fundamental of Research Methodology and Statistics.* New Delhi: New Age International Publishers.

Spector, P.E. (2019). Do Not Cross Me: Optimizing the Use of Cross-Sectional Designs. *Journal of Business and Psychology, 34*, 125–137. https://doi.org/10.1007/s10869-018-09613-8

Thanitthanakhun. K, Jitsakul, W. (2025). Competency And Guideline For Assessing Readiness To Be An Information Technology Auditor In Thailand. *Journal of Theoretical and Applied Information Technology, 103*(1), 242-255. https://jatit.org/volumes/Vol103No1/20Vol103No1.pdf

Tippins, M. J., & Sohi, R. S. (2003). IT competency and firm performance: Is organizational learning a missing link? *Strategic Management Journal, 24*(8), 745-761.

Thottoli, M. M. (2021). Impact of Information Communication Technology Competency among Auditing Professionals. *Accounting. Analysis. Auditing 8*(2), https://doi.org/10.26794/2408-9303-2021-8-2-38-47

Vijh, G., Sharma, R. & Agrawal, S. (2022). Effect of competency on employee performance and the mediating role of commitment: An empirical investigation in the IT Industry. *Journal of Information and Optimization Sciences, 43*(7), 1573-1587, https://doi.org/10.1080/02522667.2022.2128518

Wang Chen, Y., & Benitez-Amado, J. (2015). How information technology influences environmental performance: Empirical evidence from China. *International Journal of Information Management, 35*(2), 160–170. https://doi.org/10.1016/j.ijinfomgt.2014.11.005

Wessels, P. (2008). The identification and discussion of strategies for implementing an IT skills framework in the education of professional accountants. *South African Journal of Accounting Research, 22*(1), 147-181. https://doi.org/10.1080/10291954.2008.11435135

Wiersma, W. (2000). *Research Methods in Education: An Introduction* (7th Ed.) Needham Heights: A Pearson Education Company. Allyn & Bacon

Wong, S. I., & Berntzen, M. N. (2019). Transformational leadership and leader–member exchange in distributed teams: The roles of electronic dependence and team task interdependence. *Computers in Human Behavior, 92*, 381–392.