CIMEGS-SEJ

DIAMOND OPEN ACCESS · ISSN 2819-6252 (ONLINE)

CIMEGS-SEJ

Socio-Economic Journal

journal homepage: journal.cimeg.ca

VOLUME 2
ISSUE 1
YEAR 2026

REVIEW ARTICLE

Redefining Internal Audit Competencies through AI and Digital Transformation in the MENA Region

Nisrine Ouriachi, Nissrine Kamary*

National School of Business and Management, Mohammed First University, Oujda, Morocco

ARTICLE INFO

Article history

Received	13 December 2025
Revised	7 March 2026
Accepted	17 March 2026
Published	30 April 2026

Keywords

Internal audit
Artificial intelligence
Digital transformation
Audit competencies
MENA region
Resource-based view

JEL classification

M42, M15, O33

ABSTRACT

Research aims: This study examines how artificial intelligence (AI) and digital transformation are changing internal audit competencies in the MENA region.

Design/Methodology/Approach: The study uses an exploratory qualitative approach based on thematic analysis of 13 selected empirical journal articles published between 2021 and 2025. The studies were reviewed to identify recurring competency requirements and challenges, which were grouped into four domains and interpreted through the resource-based view (RBV).

Research findings: The synthesis identifies digital competencies, cybersecurity and IT risk management, communication and reporting, and organisational adaptability as recurring competency domains. The reviewed studies describe opportunities associated with AI, robotic process automation and data analytics, alongside gaps in the human and organisational capabilities required to use them effectively. They also point to the importance of regulatory and organisational conditions.

Theoretical Contribution/Originality: The study interprets emerging competency requirements as organisational resources that may support technology-enabled internal auditing.

Practitioners/Policy Implications: Organisations should develop audit competencies alongside technological investment, with attention to training, cybersecurity, change management and governance. The findings describe the included studies and should not be read as national rankings or comparable estimates of effect size.

* Corresponding author: Nissrine Kamary, nissrine.kamary20@ump.ac.ma

E-mail addresses: nisrine.ouriachi@ump.ac.ma (N. Ouriachi), nissrine.kamary20@ump.ac.ma (N. Kamary)

Cite this article: Ouriachi, N., & Kamary, N. (2026). Redefining Internal Audit Competencies through AI and Digital Transformation in the MENA Region. *CIMEGS-SEJ*, *2*(1), 31–37. https://doi.org/10.68808/71gc7407

CC BY 4.0

© 2026 The Author(s). Published by the Canadian Institute for Middle East and Gulf Studies (CIMEGS), Canada. This is an open-access article distributed under the terms of the Creative Commons Attribution 4.0 International License (CC BY 4.0), https://creativecommons.org/licenses/by/4.0/, which permits unrestricted use, distribution and reproduction in any medium, provided the original author(s) and source are credited.

1. Introduction

Artificial intelligence (AI), digital platforms, advanced analytics and interconnected information systems are reshaping organisational structures and working practices. In both public and private organisations, digital technologies influence strategy, resource allocation, risk management, communication and value creation. Digital transformation involves changes to how individuals and institutions operate and coordinate their activities. These changes draw on technologies such as machine learning, cloud computing, big data analytics, robotic process automation and blockchain. Together, these technologies contribute to an increasingly connected organisational environment (Fenton et al., 2019).

Digital transformation affects functions throughout an organisation. Managers use real-time data to monitor performance, identify operational weaknesses and inform decisions. Employees work with integrated systems, while organisations need arrangements for data quality, cybersecurity, privacy and algorithmic transparency. Organisations must also demonstrate that their systems are reliable, that they manage data responsibly and that technology-assisted decisions can be explained. These requirements create new expectations for assurance functions, including internal audit.

Internal auditing supports assurance, consulting, risk management and governance (Pickett, 2003). In MENA organisations, growing data volumes have encouraged interest in AI and audit analytics for control and oversight (Taşdöken, 2024). Auditors can use these tools to analyse transactions, automate routine procedures and detect unusual patterns (Ghafar et al., 2024).

Digital technologies also change the skills required of internal auditors. Auditors need to understand analytical tools, assess their outputs and adapt their procedures as systems change (Kruskopf et al., 2020; Ghafar et al., 2024). The selected MENA studies address these requirements in different organisational settings. This review asks: How are AI and digital transformation changing internal audit competencies in the MENA region?

The study examines the competencies that internal auditors need to work with digital technologies and the gaps described in the selected studies. It considers how technical knowledge, professional judgement and organisational support affect auditors' use of these tools.

This exploratory qualitative review compares 13 empirical journal articles published between 2021 and 2025. The thematic synthesis examines internal auditing and related audit work in selected MENA settings.

2. Theoretical and Conceptual Framework

Barney's (1991) resource-based view (RBV) links sustained competitive advantage to resources that are valuable, rare, difficult to imitate and non-substitutable. Human capital, including professional competencies, constitutes a potential strategic resource within this framework. For internal auditors, technical knowledge and analytical skills may help translate investment in digital tools into better audit work. This review uses the RBV to interpret competency requirements; it does not test whether those competencies satisfy all four conditions.

Digital transformation involves changes to organisational processes and business models as well as the adoption of technology (Daim, 2020; Gilchrist, 2018). Managers need infrastructure and operating arrangements that allow staff to use new systems (Maheshwari, 2019; Kale, 2019). Fenton et al. (2019) discuss changes in working practices and user experiences, while Schallmo and Williams (2018) and Saldanha (2019) examine how organisations manage digital transformation. In internal auditing, AI can support data analysis, automation and anomaly detection, but its use also raises questions about data privacy, skills and system integration (Ghafar et al., 2024). Public-sector audit teams face similar requirements for appropriate technical and organisational arrangements (Taşdöken, 2024).

Internal auditors therefore need to understand the tools they use and assess the evidence those tools produce. The RBV offers one way to examine how organisations develop and retain these capabilities alongside other professional skills.

3. Methodology

This study uses an exploratory qualitative approach to compare empirical research on digital technologies and audit work in selected MENA settings. The reviewed articles cover publications from 2021 to 2025 and examine AI, robotic process automation, information technology, ERP systems, cybersecurity and remote auditing.

The synthesis draws on the 13 studies listed in Table 1. For each study, the comparison records its country setting, method, participants and main findings. Most studies address internal auditing. Al Shbail et al. (2025) and Al-Hajaya et al. (2025) examine external or remote auditing and provide related evidence on skills and implementation conditions. Their findings are treated as indirect evidence for internal audit competencies.

The thematic analysis groups recurring findings into digital competencies, cybersecurity and IT risk management, communication and reporting, and organisational adaptability. The RBV provides the interpretive framework. Differences in study design and measurement limit the synthesis to a qualitative comparison of the selected settings.

Table 1 The 13 selected studies

No.	Study	Country	Methodology	Sample	Principal finding
1	Ali & Dammak (2025)	Iraq	Quantitative	145 respondents; study conducted across five private banks	Digital transformation is associated with internal audit quality and financial performance. In the final mediation model, the indirect effect through internal audit quality is significant, while the direct effect on financial performance is not significant.
2	Jaradat et al. (2025)	Saudi Arabia	Quantitative	138 certified internal auditors	RPA adoption is positively associated with internal audit efficiency, particularly when regulatory, data-security and organisational conditions are favourable.

No.	Study	Country	Methodology	Sample	Principal finding
3	Alassuli (2025)	Jordan	Quantitative	390 valid responses from 480 questionnaires	AI-enabled RPA is positively associated with internal audit efficiency, including planning and audit activity management. The study also considers execution and communication.
4	Al Shbail et al. (2025)	Jordan	Quantitative	Audit professionals in non-Big 4 firms	In non-Big 4 external audit firms, remote auditing is associated with audit quality, with staff capabilities relevant to this relationship.
5	Al-Hajaya et al. (2025)	Jordan	Mixed methods (questionnaire + semi-structured interviews)	208 external audit professionals and 11 IT audit professionals	AI-enabled remote auditing faces technological, organisational and environmental barriers, especially inadequate infrastructure, data-quality problems and shortages of AI-related skills.
6	Puthukulam et al. (2021)	Oman	Quantitative	169 internal auditors	AI and machine learning are perceived to improve professional scepticism, professional judgement and audit effectiveness, although implementation costs and training requirements remain challenges.
7	Alqaraleh et al. (2022)	Jordan	Quantitative	153 internal auditors	IT use positively affects internal audit effectiveness, with organisational culture playing a significant mediating role.
8	Elbardan et al. (2025)	Egypt	Qualitative (multiple-case study; interviews, observation and document analysis)	Two companies; interviews, observation and documents	Active internal auditor involvement in ERP implementation strengthens auditors' legitimacy, technical expertise and strategic role, whereas limited involvement and managerial distrust weaken their position.
9	Al-Khasawneh & Baniata (2024)	Jordan	Quantitative	64 respondents from 16 banks	IT use in internal auditing is moderate to high, particularly in analytical procedures and documentation; technological maturity and IT-specialist auditors significantly influence its use.
10	Alhawtmeh (2025)	Jordan	Quantitative	84 valid responses	Internal auditing is positively associated with cybersecurity effectiveness in the surveyed Jordanian government agencies.
11	Bouziane (2025)	Morocco	Quantitative	23 internal auditors	Perceived usefulness of ChatGPT is positively associated with internal audit quality, particularly by improving analysis, understanding of technical documents and audit reporting.
12	Jouiet & Ghaleb (2025)	Morocco	Qualitative exploratory study	14 public-sector internal auditors	AI adoption is constrained by fragmented infrastructure, insufficient technical skills, high costs, AI complexity, regulatory uncertainty and limited technical support.
13	Musa (2024)	Saudi Arabia	Quantitative	150 internal auditors and accountants	Augmented AI has a significant positive effect on internal audit performance, whereas assistive and autonomous AI show no statistically significant effects.

Source: Prepared by the authors.

4. Analysis and discussion of results

4.1. *Distribution of the Included Studies by Year and Country*

The selected studies include one article published in 2021, one in 2022, two in 2024 and nine in 2025. No article in this sample is dated 2023. Figure 1 uses the final issue year for Al Shbail et al. and the journal's online publication year for Ali and Dammak. These counts describe the sample and provide no measure of technology adoption over time.

Six studies examine Jordan, two Saudi Arabia, two Morocco, and one each Iraq, Egypt and Oman. The sample contains unequal numbers of studies from these settings, so the country counts cannot be used to compare national research capacity or readiness for digital auditing.

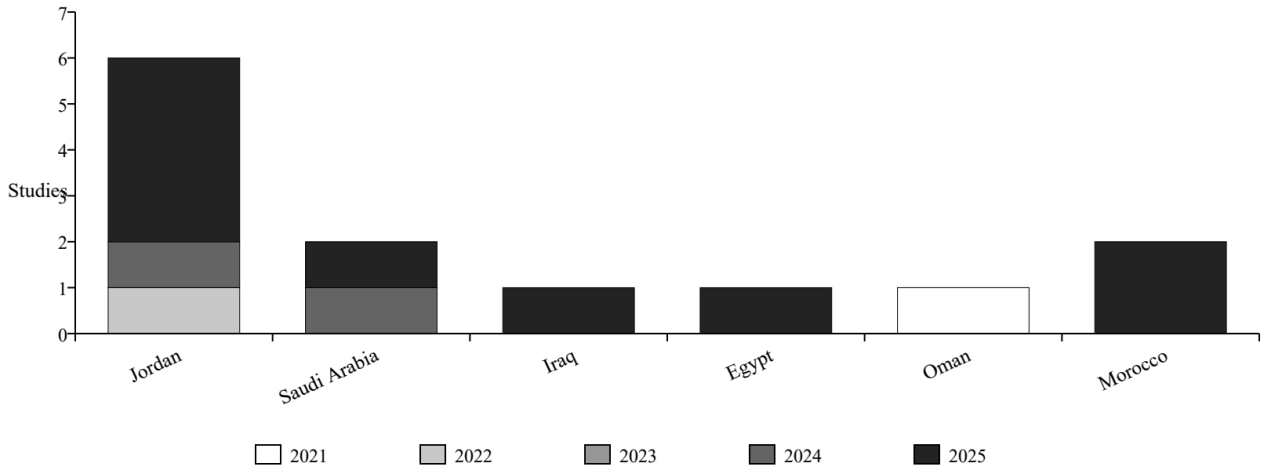

Fig. 1. Distribution of the included studies by year and country

Source: Prepared by the authors.

4.2. *Competency Requirements and Gaps in the Reviewed Studies*

The studies describe the value of digital skills for audit analysis and interpretation in particular organisations (Alassuli, 2025; Bouziane, 2025; Musa, 2024; Elbardan et al., 2025). The findings concern different tools and measures. They therefore support a discussion of competency requirements within those settings rather than a comparison of national effect sizes.

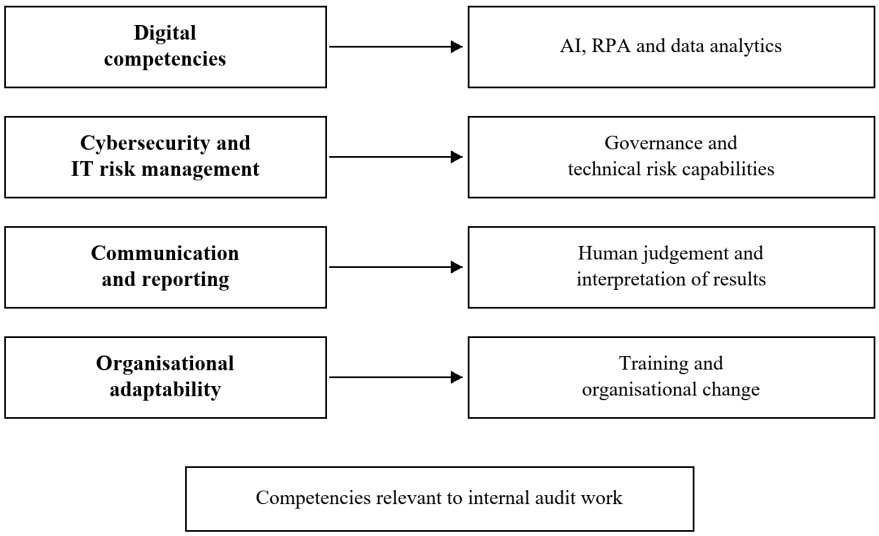

Fig. 2. Competency domains identified in the reviewed studies

Source: Authors' synthesis of the reviewed studies.

Cybersecurity and IT risk management recur in the reviewed evidence. Alhawtmeh (2025) reports an association between internal auditing and cybersecurity effectiveness in Jordanian government agencies. Jaradat et al. (2025) examine regulatory and data-security conditions associated with RPA adoption and audit efficiency in Saudi Arabia. Moroccan public-sector auditors describe regulatory uncertainty and limited support as barriers to AI adoption (Jouiet & Ghaleb, 2025). These studies point to the need for technical knowledge alongside governance arrangements that support its use.

For communication and reporting, auditors need to interpret technology-assisted analysis and explain its implications (Elbardan et al., 2025; Puthukulam et al., 2021). Alassuli (2025) reports a communication score of 3.75 out of 5, classified as high in that study, although lower than the other audit dimensions. The findings support continued attention to professional judgement when auditors use automated outputs.

Organisational adaptability concerns how audit teams change their working practices as they adopt new tools. The studies describe training needs and organisational

conditions that affect this process (Alassuli, 2025; Musa, 2024; Bouziane, 2025). Ali and Dammak (2025) report an indirect association between digital transformation and financial performance through internal audit quality. Across these settings, auditors' capabilities and organisational support matter to the use of technology.

Table 2 Gaps between traditional and emerging competencies

General Competency	Identified gaps	Findings by study setting	Critical observation
Digital competencies	**Traditional:** basic Excel, manual processes **Emerging:** AI, RPA, advanced analytics, ERP	• **Morocco:** Lack of data science skills (Jouiet & Ghaleb, 2025) • **Jordan:** Communication rated high, but lower than the other audit dimensions (3.75/5) (Alassuli, 2025) • **KSA:** No statistically significant effect of autonomous AI in the reported model (Musa, 2024)	The reviewed studies identify needs for advanced digital skills and continued training; they do not establish a universal gap.
Cybersecurity / IT risks	**Traditional:** paper-based control **Emerging:** IT audit, network security, digital compliance	• **Jordan:** Internal audit is positively and significantly associated with cybersecurity effectiveness, explaining 77.6% of its variance (Alhawtmeh, 2025) • **Morocco:** Regulatory gaps hinder AI adoption (Jouiet & Ghaleb, 2025)	Technical and governance capabilities require attention; the studies do not provide comparable national measures.
Communication and reporting	**Traditional:** basic reporting **Emerging:** automated insights, data visualization	• **Oman:** AI improves rapid data synthesis (Puthukulam et al., 2021) • **Jordan:** Communication rated high (3.75/5), although lower than the other dimensions (Alassuli, 2025)	Automation supports but does not replace human interpretation.
Adaptability	**Traditional:** rigid methods **Emerging:** continuous auditing, AI-driven processes, lifelong learning	• **Iraq:** Digitalization improves performance but requires adaptation (Ali & Dammak, 2025) • **KSA:** Effects differ by type of AI system (Musa, 2024)	Resistance to change and sector disparities remain key barriers.

Source: Prepared by the authors.

The gaps identified in the reviewed studies can be interpreted through the RBV (Barney, 1991). Traditional audit skills, including control knowledge and professional judgement, remain relevant alongside AI literacy, data analytics and RPA-related capabilities. Digital competencies may function as organisational resources, but the included studies do not establish that they are rare, inimitable and non-substitutable in every setting.

The studies describe different organisational constraints. Jouiet and Ghaleb (2025) identify skills and infrastructure barriers in interviews with Moroccan public-sector auditors. Musa (2024) reports different effects for assistive, augmented and autonomous AI in a Saudi sample. Alassuli (2025) reports a high communication score that remains lower than the other audit dimensions. These findings suggest that organisations need to develop professional capabilities alongside their digital tools; the studies do not test sustained competitive advantage.

Table 3 Implications for auditors and organisations in the reviewed settings

General Competency	Key insights	Findings by study setting	Critical observation
Digital competencies	Invest in AI and RPA training, standardise data analytics tools	Jordan and Oman: Studies report benefits associated with RPA or AI-assisted auditing Morocco and KSA: Studies describe context-specific opportunities and constraints	Infrastructure disparities and small samples affect comparability of results
Cybersecurity / IT risks	Develop regulatory frameworks and strengthen IT audit capabilities	Jordan and KSA: **Evidence on cybersecurity or adoption conditions;** Morocco: reported public-sector barriers	Governance and IT capabilities need attention; national adoption levels were not measured consistently.
Communication and reporting	Train auditors in AI-assisted interpretation and reporting	Different patterns of communication and reporting across countries	Need to balance automation with human judgement
Adaptability	Promote adaptive culture, continuous auditing	Iraq and Jordan: Studies report benefits linked to digital processes Morocco and KSA: Studies describe different organisational conditions and barriers	Training, resistance to change and organisational differences warrant further investigation.

Source: Prepared by the authors.

Table 3 sets out practical implications of the reviewed evidence for digital skills, cybersecurity governance, communication and organisational adaptability. The recommendations concern the settings examined in the studies.

Organisations can support digital competencies through training in AI, RPA and data analytics. The studies in Jordan and Oman report benefits from technology-assisted auditing, while those in Morocco and Saudi Arabia describe opportunities and constraints associated with particular tools and working conditions.

For cybersecurity and IT risk management, audit teams need technical knowledge and clear governance arrangements. The studies of cybersecurity effectiveness in Jordan and RPA adoption in Saudi Arabia provide examples of these needs within specific organisations.

For communication and reporting, auditors need to explain how they assessed technology-assisted outputs and what those outputs mean for an audit. Training can address the interpretation of analytical results and the presentation of findings to decision-makers.

For organisational adaptability, training and change management can help audit teams revise their procedures as they introduce digital tools. The reviewed evidence concerns particular organisations and sectors, so these recommendations need to be considered within each organisation's working conditions.

5. Conclusion

This review identifies digital competencies, cybersecurity and IT risk management, communication and reporting, and organisational adaptability as recurring themes in 13 empirical studies. The findings describe how auditors use AI, RPA and other digital tools in selected MENA settings. They suggest that organisations need to develop auditors' technical and professional capabilities alongside investment in technology.

The review draws on a small set of studies with different methods, samples and measures. Two studies concern external or remote auditing and provide indirect evidence for internal auditing. These differences limit comparison across countries and prevent regional estimates of effect size or national rankings of adoption.

Future research should examine competency requirements using primary data from internal auditors in different countries and sectors. Common measures and transparent reporting of samples, coding procedures and study quality would improve the basis for comparison.

Declarations

Author Contributions. Conceptualization, N.O. and N.K.; Methodology, N.O. and N.K.; Investigation, N.O. and N.K.; Data curation, N.K.; Formal analysis, N.K.; Writing (original draft preparation), N.K.; Writing (review and editing), N.O. and N.K.; Supervision, N.O. All authors have read and agreed to the published version of the manuscript.

Funding. This research received external funding from the National Center for Scientific and Technical Research (CNRST) under the PhD-Associate Scholarship (PASS) program.

Conflicts of Interest. The authors declare no conflicts of interest.

Ethics Approval and Informed Consent. Not applicable.

Data Availability Statement. The published studies used in this review are listed in the references.

Declaration of Generative AI Use. Grammarly was used for language refinement. AI-assisted tools were also used for language editing and reference checking.

Acknowledgements. This research was supported by the National Center for Scientific and Technical Research (CNRST) under the PhD-Associate Scholarship (PASS) program.

References

Al Shbail, M. O., Jaradat, Z., Al-Hawamleh, A., Hamdan, A., & Alsartawi, A. M. A. M. (2025). Enhancing audit quality in non-Big 4 firms: The role of remote auditing and audit staff capabilities. Journal of Financial Reporting and Accounting, 23(2), 700–720. https://doi.org/10.1108/JFRA-11-2023-0653

Alassuli, A. (2025). Impact of artificial intelligence using the robotic process automation system on the efficiency of internal audit operations at Jordanian commercial banks. Banks and Bank Systems, 20(1), 122–135. https://doi.org/10.21511/bbs.20(1).2025.11

Al-Hajaya, K., Alma'aitah, R. T., Salem, R. I. A., & Hutaibat, K. (2025). Understanding challenges of conventional remote auditing and AI-enabled remote IT auditing: Audit professionals' perspectives from an emerging economy. Journal of Accounting & Organizational Change. Advance online publication. https://doi.org/10.1108/JAOC-12-2024-0395

Alhawtmeh, O. M. (2025). The role of internal audit as a tool for enhancing cybersecurity effectiveness in Jordanian government agencies. Heritage and Sustainable Development, 7(1), 317–328. https://doi.org/10.37868/hsd.v7i1.1130

Ali, A. H., & Dammak, S. (2025). The impact of digital transformation on internal auditing and financial performance of Iraqi banks. Journal of Ecohumanism, 3(8), 12080–12103. https://doi.org/10.62754/joe.v3i8.5804

Al-Khasawneh, R. O., & Baniata, J. A. S. (2024). The extent of using information technology in internal auditing and the differences in its use in Jordanian banks. Journal of System and Management Sciences, 14(1), 418–435. https://doi.org/10.33168/JSMS.2024.0124

Alqaraleh, M. H., Almari, M. O. S., Ali, B. J. A., & Oudat, M. S. (2022). The mediating role of organizational culture on the relationship between information technology and internal audit effectiveness. Corporate Governance and Organizational Behavior Review, 6(1), 8–18. https://doi.org/10.22495/cgobrv6i1p1

Barney, J. B. (1991). Firm resources and sustained competitive advantage. Journal of Management, 17(1), 99–120. https://doi.org/10.1177/014920639101700108

Bouziane, A. (2025). The impact of using ChatGPT on internal audit quality: A case study of a subsidiary of an oil group in Morocco. EDPACS, 70(3), 42–54. https://doi.org/10.1080/07366981.2025.2450876

Daim, T. U. (Ed.). (2020). Digital transformation: Evaluating emerging technologies. World Scientific Publishing Company. https://doi.org/10.1142/11675

Elbardan, H., Nordberg, D., & Sinha, V. K. (2025). Reconstructing legitimacy of internal auditing during ERP implementations: Two contrasting cases. Journal of Accounting Literature, 47(5), 184–210. https://doi.org/10.1108/JAL-01-2023-0001

Fenton, A., Fletcher, G., & Griffiths, M. (Eds.). (2019). Strategic digital transformation: A results-driven approach. Routledge.

Ghafar, I., Perwitasari, W., & Kurnia, R. (2024). The role of artificial intelligence in enhancing global internal audit efficiency: An analysis. Asian Journal of Logistics and Management, 3(2), 64–89. https://doi.org/10.14710/ajlm.2024.24652

Gilchrist, A. (2018). Digital success: A holistic approach to digital transformation for enterprises and manufacturers. Independently published.

Jaradat, Z., Al-Hawamleh, A. M., Al Shbail, M., & Hamdan, A. (2025). Innovative practices: Assessing the impact of robotic process automation adoption on internal audit efficiency in KSA. Journal of Science and Technology Policy Management. Advance online publication. https://doi.org/10.1108/JSTPM-06-2024-0230

Jouiet, I., & Ghaleb, N. E. A. E. (2025). Barriers to the integration of artificial intelligence in public sector internal audit in Morocco: An exploratory study. Edelweiss Applied Science and Technology, 9(5), 1291–1302. https://doi.org/10.55214/25768484.v9i5.7139

Kale, V. (2019). Digital transformation of enterprise architecture. CRC Press. https://doi.org/10.1201/9781351029148

Kruskopf, S., Lobbas, C., Meinander, H., Söderling, K., Martikainen, M., & Lehner, O. M. (2020). Digital accounting and the human factor: Theory and practice. ACRN Journal of Finance and Risk Perspectives, 9(1), 78–89. https://doi.org/10.35944/jofrp.2020.9.1.006

Maheshwari, A. (2019). Digital transformation: Building intelligent enterprises. Wiley.

Musa, A. M. H. (2024). Detecting the effect of artificial intelligence on internal audit performance: Empirical study in Saudia Arabia. Decision Science Letters, 13(4), 967–976. https://doi.org/10.5267/j.dsl.2024.7.003

Pickett, K. H. S. (2003). The internal auditing handbook (2nd ed.). John Wiley & Sons.

Puthukulam, G., Ravikumar, A., Sharma, R. V. K., & Meesaala, K. M. (2021). Auditors' perception on the impact of artificial intelligence on professional skepticism and judgment in Oman. Universal Journal of Accounting and Finance, 9(5), 1184–1190. https://doi.org/10.13189/ujaf.2021.090527

Saldanha, T. (2019). Why digital transformations fail: The surprising disciplines of how to take off and stay ahead. Berrett-Koehler Publishers.

Schallmo, D. R. A., & Williams, C. A. (2018). Digital transformation now!: Guiding the successful digitalization of your business model. Springer. https://doi.org/10.1007/978-3-319-72844-5

Taşdöken, Ö. (2024). Use of artificial intelligence and audit analytics in internal audit processes in the public sector. EDPACS, 69(9), 1–15. https://doi.org/10.1080/07366981.2024.2376790