Management Control, Auditing and Finance Review - MCAFR

Management Control, Auditing and Finance Review (MCAFR)
- Volume No.2, Issue No. 2 – 2025 - ISSN: 3009-5492

Impact of Artificial Intelligence and Machine Learning Adoption on Audit Quality and Risk Detection in Moroccan auditing firms

L'impact de l'Intelligence Artificielle et l'Apprentissage Automatique sur la Qualité de l'Audit et la Détection des Risques dans les cabinets d'audit marocains

HELMI DRISS
PhD, Professor of Higher Education, Interdisciplinary Research Laboratory in Economics, Finance, and Organizational Management, Sidi Mohamed Ben Abdellah University, Fez, Morocco
d.helmi@ump.ac.ma

BARHDADI AYA
PhD Candidate, Interdisciplinary Research Laboratory in Economics, Finance, and Organizational Management, Sidi Mohamed Ben Abdellah University, Fez, Morocco
aya.barhdadi1@usmba.ac.ma

RÉSUMÉ

Face à l'évolution progressive des pratiques d'audit dans le monde et l'alignement aux standards internationales, les cabinets d'audit sont plus dirigés vers l'adoption des outils d'intelligence artificielle et de machine learning dans le but d'améliorer la qualité de l'audit et la détection effective des risques. Comme le Maroc aspire à suivre les meilleures pratiques internationales, cet enjeu devient particulièrement crucial en vue de renforcer continuellement les capacités de détection des risques, ce qui conduit, de manière séquentielle, à une amélioration de la qualité de l'audit.

Cet article examine les facteurs influençant l'adoption des outils de l'intelligence artificielle et du machine learning en se basant sur les fondements théoriques du TAM et de l'UTAUT et analyse leur impact potentiel sur la qualité de l'audit et la détection des risques dans le contexte marocain.

L'article propose une réflexion conceptuelle fondée sur une revue approfondie de la littérature articulée en deux niveaux fondés sur la facilité perçue et l'utilité perçue de ces outils par les professionnels du domaine, pour évaluer in fine l'impact réel de leur adoption sur la qualité d'audit et la détection des risques.

Mots-clés : Intelligence artificielle, Machine learning, Facilité perçue, Utilité perçue, Qualité de l'audit, Détection des risques.

ABSTRACT

Faced with the progressive evolution of auditing practices worldwide and the need to align with international standards, audit firms are increasingly turning to the adoption of artificial intelligence and machine learning tools with the aim of improving audit quality and enhancing effective risk detection. As Morocco aspires to follow international best practices, this issue becomes particularly critical, as it continuously strengthens risk-detection capabilities, which sequentially leads to improved audit quality.

This article examines the factors influencing the adoption of artificial intelligence and machine learning tools based on the theoretical foundations of the TAM and UTAUT models and analyzes their potential impact on audit quality and risk detection within the Moroccan context.

The study proposes a conceptual reflection based on an in-depth review of the existing literature, structured around two key dimensions: perceived ease of use and perceived usefulness of these tools among professionals in order to ultimately assess the real impact of their adoption on audit quality and risk detection.

Key-words : Artificial intelligence, Machine learning, Perceived ease of use, Perceived usefulness, Audit quality, Risk detection.

1. INTRODUCTION

The readiness of companies to adopt new technologies such as artificial intelligence and machine learning represents a complex combination of financial and digital information and decision-making. This study seeks to clarify these complex dynamics within the Moroccan context, shedding light on the determinants of adopting these technologies and their impact on audit guidelines such as audit quality and risk detection. In a rapid expansion context of digital technologies, the auditing profession in Morocco is undergoing a profound transformation. The integration of Artificial Intelligence (AI) and Machine Learning (AI) raises a central question: **To what extent can these tools enhance audit quality and strengthen the proactive detection of financial and organizational risks?**

Considering this context, this study attempts to explore the determinants of the adoption of AI and ML tools and how this adoption affects audit quality and risk detection. Another objective of this study is to increase the understanding of individuals within the Moroccan financial auditing practices and provide audits with better valuable insights.

We came up with the following research questions to examine these determinants:

- What is the impact of Perceived ease and Perceived use on the adoption of new technologies?
- What relationships do these variables have with one another in affecting the intention to adopt AI and ML tools?
- What is the impact of this adoption on audit quality and risk detection?

This article is structured around a conceptual progression that begins with the theoretical framework through which the intention to adopt is examined by analyzing its key elements. By following the components of these theories, the insights bring out the perceived ease of use of AI and ML tools which is examined through two subsections: the personal skills of auditors, reflecting their adaptability or resistance to change, and their professional skills, reflecting their technical expertise and ability to integrate daily with these new technologies into audit procedures. Together, these competencies shape the auditors' perceived ease of use and naturally lead to the second major dimension of the framework: perceived usefulness.

Based on the TOE model, this dimension is divided into two subsections. The organizational factors address internal elements such as technological infrastructure, strategic orientation, and managerial support that enable or constrain adoption, while the environmental factors focus on external pressures including regulatory requirements, competitive dynamics, and client expectations.

Finally, these two major dimensions converge toward the last part of the study, which represents its primary objective: assessing the impact of AI and ML tools adoption on audit quality and risk detection within Moroccan auditing firms.

Through this structure, the article aims to provide a conceptual framework for the adoption of artificial intelligence and machine learning tools, while opening avenues for future research on the challenges and long-term implications of this adoption into auditing practices.

2. THEORITICAL FRAMEWORK

Through this extensive literature review, the study aims to establish a theoretical foundation for understanding the dynamics driving the adoption of AI and ML tools in emerging economies like Morocco. In fact, the impact of AI and ML tools adoption on company performance varies widely based on the specific processes implemented, thereby, auditors are now reflecting on and rethinking traditional methods to enhance audit quality and efficiency through AI technologies.

Recognizing the relevance of IT in this context, organizations, accountants, auditors, professional bodies, academics, and regulators have switched their focus to improving auditing and accounting processes using technology (Urich Joe Saly & Ektik, 2025). These interests have grown because of the increasing complexity of business environments and of course the need for higher audit quality. Studies were conducted in Vietnam and Saudi Arabia, which showed that technology readiness and perceived ease of use strongly influence the willingness for auditors to adopt new AI tools (Abdullah & Almaqtari, 2024), this adoption is no longer considered optional, but rather a key lever for maintaining the relevance of the auditing profession. Auditors are increasingly using innovative tools when they feel technologically prepared and when systems are designed to be intuitive and user-friendly.

The Technology Acceptance Model (TAM) and the Unified Theory of Acceptance and Use of Technology (UTAUT), provide a basis for understanding the factors that influence the adoption and usage of technology by introducing many beliefs that include the perceived ease of use which is theorized to be fundamental determinant of system use (Davis, 1989). Auditors are thinking of how comfortable and confident they can feel when interacting with AI and ML tools (Salaja, 2025). This comfort level is highly related to trust in technology and the alignment of these tools with professional judgment and ethical standards.

From auditors' perspectives, the variable of perceived ease of use is further subdivided into two dimensions: personal and professional competencies. The stronger these competencies are, the more effortless the adoption process becomes. Auditors with well-developed personal skills: adaptability, openness to change, and teamwork and professional skills: technical knowledge, educational background, and experience with information systems, more likely to perceive AI and ML tools as easy to use, since they already have the essentials required for this implementation (Kokina et al., 2025). This means immediately that continuous professional development is very important in reinforcing auditors' readiness for AI adoption.

The technology–organization–environment (TOE) framework is described in Tornatzky and Fleischer's The Processes of Technological Innovation (L.G & M., 1990). This model describes the way firms' context influences the adoption and implementation of new technologies. The TOE framework is an organization-level theory that explores three different elements that influence adoption decisions. These three elements are the technological context, the organizational context, and the environmental context. Following the contextual elements of this model, this framework simplifies the understanding of perceived usefulness by analyzing the determinants of adoption from auditors' perspective of innovation.

By integrating TOE with TAM-related concepts, this study reinforces the explanatory power of the model, it shows how perceived ease of use and usefulness are shaped by many factors, not only by individual

auditors' perceptions but also by broader organizational and environmental forces, and afterwards strengthens the overall analytical framework of AI and ML adoption in auditing.

3. DIMENSIONS SHAPING ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING ADOPTION: EASE OF USE AND USEFULNESS PERCEPTIONS

On a personal level, auditors may exercise resistance to change, often driven by concerns about AI bias because many algorithms may favor efficiency over fairness which leads to false positives in the audit's final results, also by concerns about lack of transparency, for example in some cases, auditors are unable to explain why a transaction was flagged or even how risk scores are calculated, so basically, hidden biases remain undetectable, finally other concerns can relate to uncertainty regarding the performance and reliability of such tools. Furthermore, the integration requires strong teamwork skills, because these technologies demand collaborative learning and coordinated efforts across audit teams: The process of implementation involves multidisciplinary collaboration that goes beyond audit committees and requires others team members including IT specialists, data scientists, risk managers, accounting experts, … who bring together diverse expertise and support the learning and the consistency of adopting these tools in the auditing firm. On a professional level, successful adoption depends heavily on auditors' educational and professional priorities, including their understanding of information systems and digital processes; they embrace AI when it aligns with their career goals and professional responsibilities, otherwise they will definitely resist its use. Continuous employee training in emerging technologies is also crucial to ensure auditors' followed methodologies (Riana et al., 2024). Without compromising quality or ethical standards, the auditors must understand how AI and other advanced tools function and most importantly how to integrate them into traditional audit processes. Ultimately, continuous auditor's learning and training ensures that technological adoption strengthens audit effectiveness while they are sure that they still follow the proper auditing methodologies.

3.1. Perceived ease of use: Human-Centered Determinants:

a. Auditors' Personal Skills and Digital Adaptability:

One of the key behavioral factors influencing the adoption of AI is the auditor's resistance to change. Trust in technology is found to be another drawback to AI implementation in audits because of uncertainty and the lack of transparency related to how the analyses are generated and because auditors generally do not take part in the development of the tools and therefore find it challenging to trust them (Seethamraju & Hecimovic, 2023). In Morocco, the protection of data against AI refers to the general regulations concerning the protection of natural persons with regard to the processing of divers' data. This protection is anchored in Law No. 09-08 on the Protection of Individuals with Regard to the Processing of Personal Data enacted by the National Commission for the Control of the Protection of Personal Data (CNDP) in Morocco in 18th February 2009 to protect individuals against abuses of data use that could undermine their privacy. It grants individuals rights such as the collection, recording, organization, storage, adaptation or modification, extraction, consultation, use, communication by transmission, dissemination, or any other form of making available, combination or interconnection, as well as locking, erasure, or destruction, and ensures that personal data must be processed fairly and lawfully and can only be processed if the data subject has unquestionably given their consent to the intended operations. This law protects against automated processing that could affect the analysis unfairly, thereby providing a legal basis for oversight of AI systems handling personal data.

The conclusion of audit relies heavily on professional judgment which makes auditors fear the algorithm of the decision-making of AI and machine learning tools (Urich Joe Saly & Ektik, 2025). The AI models make predictions based on patterns in historical data while the conclusion of an audit heavily requires experience, intuition, and ethical reasoning which a computer program may lack. So essentially, this fear could block auditor's intention to implement these new tools and keep their traditional audit models based essentially on their critical thinking and professional skepticism.

Additionally, concerns about bias and transparency in AI tools amplify this reluctance; if auditors cannot clearly explain how an AI model reaches its conclusions, it may conflict with auditing standards that require accountability, documentation, and traceability of evidence.

The adoption of such technologies involves also collaboration between auditors, data scientists, and IT experts (Abdullah & Almaqtari, 2024). The major change in how audits are conducted makes teamwork essential by combining diverse expertise, no one person has all expertise required to ensure works correctly and produce reliable outputs and results.

Effective communication, teamwork, and inter-disciplinary cooperation thus become essential soft skills that enhance a good adoption of AI and machine learning tools. A conceptual framework developed by Al-Hattab & Sari (2024) emphasizes that AI is transforming auditing into a real-time, proactive, and collaborative process, demanding enhanced coordination across teams. As new AI technologies are introduced, team members learn increasingly from each other and they collaborate together to develop and upgrade their skills collectively.

b. Auditors' Professional Skills and Technological Proficiency:

Organizationally, the authors document the significant global investment in auditor upskilling; many challenges related to humans using AI tools are also identified (Kokina et al., 2025). The technology alone cannot improve audit quality without capable human operators, that's why many audit firms are increasingly investing in continuous training programs.

A recent study published in Review of Accounting Studies found that "AI workers" tending to have strong technical backgrounds in computer science, data analytics and engineering, supports AI integration in audit functions. The thing that enhances their comfort level with these technologies and the process of implementation. Their expertise allows them to implement, and maintain complex AI systems correctly and later on produce meaningful and reliable insights. This mastery enhances auditors' comfort levels with AI and encourages them to adopt new workflows smoothly.

This approach shows the importance of continuous adequate training of the professionals using Ai and machine learning tools (Riana et al., 2024). This could include encouraging knowledge sharing and collaboration among practitioners, and creating partnerships between industry and academics to support domain-specific AI research and development (Abdullah & Almaqtari, 2024). Knowledge sharing within professional communities allows auditors and other practitioners to exchange insights in real-world audit environments through collaborative platforms (online collaboration) or professional networks and workshops (on-site collaboration) helping refine the different approaches of collaborators and consequently learn from one another's successes and mistakes.

This collaborative approach is essential while talking about the procedure of implementing AI in the audit firms because it helps accelerating the identification of potential biases and limitations in AI systems and later on it helps practitioners to develop more robust solutions in this uncertain field.

From one hand the academic researchers explore novel algorithms and frameworks, while industry partners can provide access to real-world datasets and feedbacks. Moreover, these partnerships are the biggest source of training programs and workshops that prepare auditors to work without hesitation with AI and machine learning tools with the objective of strengthening the efficiency and effectiveness of audit results by combining their critical judgement with the decisions generated by AI systems. Consequently, by promoting open communication, a deep trust is built among practitioners that ultimately enhance the overall quality, and reliability of audit opinions supported by AI systems.

The auditors' assessment relies heavily on their correct interpretations and conclusions, as AI tools evolve, auditors must keep pace with technological advancements through ongoing professional development and interdisciplinary education combining accounting, statistics, and information systems (Salaja, 2025). To frame or define the complexity and especially the large volume of modern financial data, the traditional practices and the old audit techniques aren't completely sufficient because they rely on manual procedures solely based on professional judgment. So, without adequate technical knowledge and educational background, auditors risk misinterpreting model outputs or misusing AI systems, which can lead to serious consequences related to incorrect interpretations, biased conclusions, or overreliance on automated results without sufficient professional skepticism. Interdisciplinary education that combines many fields like accounting, statistics, and information systems transform the unique skill auditor to a multiskilled auditor profile who is strong enough in term of understanding the financial, statistical and analytical context so he can identify patterns and anomalies based on knowledge and detects risks in large datasets by navigating easily and effectively digital platforms. Without forgetting, that the staying in touch with technological advancements fosters resilience in audit practice, the thing that strongly helps meeting the expectations of stakeholders in an increasingly digital financial environment.

This part directly points to another important factor related to the ease of AI adoption which is the critical judgement and skepticism of auditors which allows them to leverage AI not just as a passive tool but as an active component of their analytical reasoning (Salaja, 2025). Auditors shouldn't accept the AI-generated outputs as they are, instead, they have to apply their critical judgement based on their experience, contextual understanding, and ethical responsibility to question the results produced by these algorithms, then interpret them through a structured process generally mentioned in the audit methodology and finally validate them by applying some additional audit procedures such as substantive testing and analytical reviews to produce validated insights that are supported by appropriate audit evidence. In essence, auditors should definitely interpret AI outputs not as automated decisions but as a partial result that need to be guided by the central role of human judgment. This sense has a positive impact on the intention of pursuing this digital transformation as auditors question algorithms to analyze evidence, the thing that enhances the accuracy and depth of their assessments. So basically, the integration of AI in auditing requires a strong synergy between human critical judgement and skepticism and AI driven tools and programs to maintaining accountability for the final audit opinion because AI tools and machine learning used solely cannot exercise professional skepticism neither justify conclusions in line with auditing standards and traditional auditing

practices alone are kind of insufficient and lacking effectiveness in today's complex environment and data-intensive systems.

3.2. Perceived Usefulness: Organizational and Environmental Factors:

The belief of usefulness and worth of adoption is related to many factors that form together the perceived usefulness or else named the perceived benefits that refer to the overall belief of auditors that adopting a new technology is going to be valuable and worthwhile positive transformation of work practices and contributes to better outcomes. In this conceptual model, two main categories of factors shape the perceived usefulness of AI and machine tools adoption in audit firms. These factors are classified into two main dimensions: the organizational factors and the environmental factors within the audit firm that shape together how useful auditors think AI and ML tools will be. In other words, how auditors recognize that AI and ML tools can meaningfully support their daily tasks.

The internal conditions play a pivotal role in reshaping the intention of adopting AI and ML tools, such as management support that instantly provides the necessary guidance and encouragement that auditors need in this transitional phase without showing resistance to change manners, level of technology sophistication that helps a smoother implementation by determining how advanced and reliable the available AI and ML tools actually are and finally the availability of the technology itself that directly impacts whether auditors can realistically use AI in their daily tasks (Seethamraju & Hecimovic, 2023).

To analyze and study this adoption, Louis G. Tornatzky and Mitchell Fleischer (L.G & M., 1990) have developed the Technology-Organization-Environment (TOE) to explain clearly how organizations regardless of their size or nature of operations adopt and implement technological innovations.

These two researchers found out the reasons why some organizations successfully adopt new technologies while others struggle or fail and came with discovering the influence exercised by the combination of internal and external factors rather than just technology characteristics alone.

As found, there are the technological factors that embraces the characteristics of the technology itself, then the organizational factors which relate essentially on the internal conditions of the organization and the environmental factors pertaining to external pressures. Together, they form big influencers of the adoption and adaptation of technological innovations by firms and individual professionals including AI and ML tools.

a. Organizational factors:

Management support, including actions, resources, signals and behaviors from firm leaders that encourage the digital transformation and so the adoption of new technologies, is a critical antecedent of auditors perceived usefulness of AI/ML tools. When leaders actively support AI, the rest of employees are more convinced that these tools are rewarded and useful for firm goals which raises automatically the perceived usefulness. By doing so, leaders send strong signal that adopting AI is not only allowed but valued. Which strengthens the auditors' confidence and motivation toward using these tools effectively because they thing unconsciously that they have backing from the top; in this encouraging environment, the promotion of adopting AI models is convincing the audit team of the usefulness and benefits of these tools.

If management is indifferent or opposes tech changes, auditors assume tools won't yield benefits or won't be usable in practice (Seethamraju & Hecimovic, 2023). In this way, if auditors lack support, they will perceive that the implementation process is quiet unnecessary and doesn't align with the organizational priorities; this misunderstanding will produce a strong resistance and fear of change and the outcome will ultimately limits the potential benefits of AI in the organization. In contrast to this misguidance, when leaders provide real benefits and show that the organization is serious about integrating innovation, they create an encouraging environment where auditors are not just using technology for the sake of it, but they are genuinely integrating it into their work and seeing the benefits firsthand.

The management support combines instrumental factors that are tangible and practical (funding, training, infrastructure). These concrete resources help auditors feel equipped and capable of using the technology effectively. And also, symbolic factors that are intangible and influencing strongly the attitudes and behaviors (vision, communication, role modelling). They together facilitate the process of adoption of AI and ML tools by the rest of the firm's professionals: instrumental support shows the means to use of artificial intelligence and machine learning tools, while symbolic support encompasses the necessary motivation and confidence towards using them. Resources alone can be deficient and vision alone may overcome practical obstacles.

Also, without proper training, auditors may not understand what AI can really provide for them, which significantly limits its effective use in auditing. Some of the most known outcomes of AI programs are the flagged unusual transactions and patterns that deviate from historical norms, if the auditor doesn't have the appropriate background and isn't trained enough, he cannot understand and interpret properly the generated alerts which leads directly to dismissing AI outputs and automatically to improper audit decisions.

Data suggests that being technologically-savvy does not necessarily mean learning how to code or write a language software, like R or Python. It is more about understanding the data output and what technology is capable of (Seethamraju & Hecimovic, 2023). Proper training includes at the same time structured and practical learning process that gives audit teams information back-up to understand what AI models do without requiring them to become data scientists and later on question their outputs grounded in real audit scenarios, so the learning has to be also continuous involving not only a one-time session but series of workshops and training updates; all of this process should be accompanied by the critical judgement of auditors and skepticism.

Auditors and firms are more aware of the importance of digital transformation over the world; they become more investing in training and developing robust ethical guidelines that set the principles required to mentor the way that AI and ML tools are used in auditing aligning with existing professional codes of ethics. Generally, firms are nowadays creating internal AI governance frameworks, which define in clear terms the members who can use AI tools, for what purposes, and under what conditions they can employ them. In essence, continuous training and upskilling of auditors are essential for maximizing the benefits of AI in audits.

To fully leverage the potential of AI, auditors and firms must invest in training, development of robust ethical guidelines, and ensure that AI tools are integrated within a clear regulatory framework. Future research should focus on addressing these challenges and further exploring the impact of AI on audit

practices (Kokina et al., 2025). Morocco has been actively pursuing the development of its digital economy over the years. Many initiatives were introduced in the country from 2005, , including e-Maroc 2010, Maroc Numeric 2013, and Maroc Numeric 2020. A dedicated Ministry of Digital Transition has been established in 2021 and in 2008, the 'Digital Morocco 2013' program was launched to support the development of the digital economy and promote innovation and entrepreneurship. Lately, the Digital Morocco 2030 Strategy, was officially launched on September 25, 2024 that contains three main enablers including Cloud computing, Artificial Intelligence (AI) and connectivity and Talent development.

Regular updates, e-learning platforms, and on-demand tutorials are some ways to help auditors to observe tangible performance improvements during their daily work which make them feel more confident and see practically how these tools are beneficial rather than intimidating. Before adopting new tools, it is necessary to ensure technical assistance that proves the actual work during the engagements. Consequently, systematic training sessions for all levels are required to build experienced audit team members who view the use and importance of AI and ML tools and visualize performance gains (Kokina et al., 2025).

Auditors can't perceive the usefulness of AI and ML tools without the availability of adequate resources and infrastructure. The implementation process doesn't rely on software only, but it requires also hardware including datasets and platforms that support them using these innovative tools. In fact, they may remain skeptical about their practical value if the firm doesn't provide the necessary conditions for successful implementation (Seethamraju & Hecimovic, 2023). Without these conditions, auditors may experience a state of frustration and doubt about the technology's usefulness.

Moreover, even if auditors are motivated, they cannot perceive usefulness if they lack access to relevant software or datasets, good computing resources and most importantly secure digital systems that all together are considered as facilitating conditions based on the UTAUT theory. These factors are very important when it comes to apply new technologies effectively in real-world contexts. And without them, auditors go through many technical struggles to integrate AI insights into their decision-making and prevent them from using these tools effectively.

Further, the skillsets required to work with these emerging technologies don't rely solely on human bases but also on technical ones. Therefore, many firms and organizations are investing heavily on modern IT systems and reliable data to maintain such technologies, and also to reduce the fear of auditors due to it: When data is poor, or inaccessible, auditors will not see AI as useful because the models cannot generate meaningful insights (Seethamraju & Hecimovic, 2023).

b. Environmental factors:

The environmental factors are developed in other theories in extended TAM frameworks such as the unified UTAUT theory of acceptance and use of technology (UTAUT) that treats the social influence and performance expectancy which describe the degree to which auditors believe their organization provides the necessary support, infrastructure and resources to use AI and ML tools effectively (Venkatesh et al., 2003).

When discussing the environmental dimension, it is important to recognize many external elements that interact together to influence the process of adoption. They collectively shape auditors' perceptions

regarding the usefulness of such technologies. It includes regulatory frameworks, client expectations technological environment and industry trends.

Every implementation process begins with governance and standards well established; as a result, the IASB has developed a working group focused on technology (Kokina et al., 2025). Appropriate governance framework for automations is required to not let the auditors question the readiness of govern these new tools. The audit framework is in need for regulatory guidance, especially when it comes to new technologies; regulations should keep up with the developments. The introduction of regulation that sets expectations for the use of AI in financial reporting and auditing can begin to address their fear toward. Then, it is important to mention that many previous studies point to delayed adoption of new technologies in auditing due to regulations and the need for additional safeguards that explain clearly how they should conduct their work and maintain compliance. Over the past decades, In Morocco, audit firms operate under the guidance of national and international standards such as L' Ordre des experts comptables du Maroc (OEC), the international standards of auditing (ISA) and Morocco's broader policies, who together shape the environment in which auditors assess whether these tools can be effectively adopted or not.

In environments where regulatory frameworks remain unclear or overly rigid, most auditors may view AI and ML tools adoption as risky and incompatible with accepted standards which can limit their willingness and desire to integrate these tools; perceived regulatory uncertainty explains this hesitation and so the perceived usefulness of technological innovation (Kokina et al., 2025). In Morocco, audit firms operate under the guidance of national and international standards such as the Ordre des experts comptables du Maroc (OEC), the international standards on auditing (ISA) and Morocco's broader digitalization policies, who together shape the environment in which auditors assess whether these tools can be effectively adopted or not based on their trust and vision.

Beyond the regulatory environment, the external environment is formed by client pressure and market competition. This factor represents another critical component of the external environment influencing auditors' perspective, especially recently when audit clients have become increasingly demanding and quality conscious. Rao and Singh (2024) offer study cases as empirical evidence showing that use of AI improves client happiness which makes a kind of external pressure on auditors. Audit clients are aware of the digital transformation in auditing based on the new market dynamics which increases the competitive pressure among audit firms. As a result, the adoption of AI and ML tools is no longer just a choice but a strategic necessity to maintain client trust and market position. Clients naturally prefer working with firms that have technologically advanced practices. Thus, as pointed in the study case of Ravi Seethamraju and Angela Hecimovic, one of the biggest challenges is getting good data before AI can be adopted, and clients are slow to invest in digitization and data quality, consequently, they still have piles of paper on their desks (Seethamraju & Hecimovic, 2023).

In fact, client pressure often goes hand in hand with the technological trends and level of digital maturity within the audit industry itself. The technological environment is the context that defines the availability and accessibility of digital tools and infrastructures; here comes the role of vendors and external support ecosystems who help the auditing firm to access specialized software. Innovation partners bridge the gap between technological potential and professional application through training sessions, demonstration workshops, and personalized implementation support (Seethamraju & Hecimovic, 2023). This ecosystem

not only encourages auditors to see the perceived benefits of the implementation process but also ensures that technological innovation has tangible improvements in audit quality and risk detection. In front of this situation, the ecosystem bridges the gap between theoretical technological capabilities and practical audit application which encourages auditors to perceive the benefits of AI and ML tools rather then resisting the change.

4. TOWARDS A DIGITALIZED AUDIT: THE IMPACT OF ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING TOOLS ADOPTION ON AUDIT QUALITY AND RISK DETECTION:

After considering the organizational and environmental enabling, and the personal and professional skills, auditors are more likely to develop positive perceptions toward AI and Machine Learning tools. This situation demonstrates that once the perceived usefulness and perceived ease of use are well established, the transition from intention to actual adoption naturally occurs. At this stage, audit firms move beyond theoretical acceptance and begin to invest strategically in digital transformation. For instance, this transition raises many critical questions related to the real outcomes; the focus of auditor's changes from why and how to adopt new technologies toward what impact they truly generate (Urich Joe Saly & Ektik, 2025).

This new phase of inquiry is crucial by questioning the real value and effectiveness of technological integration in auditing. Auditors start looking for and understanding the tangible impact of AI and ML tools that allows them to evaluate whether they strengthen the core objectives of auditing or make it weak and unvaluable.

When talking about risk detection, AI and ML tools have a strong impact on the different stages, starting from the planning stage to the opinion and reporting stage; these tools has brought a big shift in the way auditors identify and assess risks. In the audit planning and also reporting phases, AI and ML tools help auditors to focus on the areas of greater risk by analyzing entire, complete and detailed populations of data instead of sampling methods (Seethamraju & Hecimovic, 2023). Traditionally, auditors proceed to some tests of controls and substantive testing, so they only review a limited subset of transactions manually chosen, which may limit the scope of risk identification and so can miss some hidden irregularities. In contrast, by adopting new technology it is easy to test entire populations of transactions and datasets rather than samples. In this way, processing massive amounts of structured and unstructured data risk detection will be more efficiently performed by AI and machine learning tools by detecting all unusual patterns that may signal financial irregularities or fraud (Seethamraju & Hecimovic, 2023).

Prior literature confirms that with the help of AI and ML tools, the auditors perform more in- depth analyses of transactional data, based on the programmed and computerized algorithm that identify patterns easily within data sets, thereby making sure auditors can comprehend specific areas of risks more efficiently at an unrivalled speed (Urich Joe Saly & Ektik, 2025). Moreover, technological models enhance the process of risk detection by continuously learning from past audit outcomes. AI tools rely on historical data to build models and develop systems that can predict and detect risks so that specific comparisons between current-period transactions and the patterns learned from the past could be operated (Suyono et al., 2025). Using historical data allows AI and ML tools to build predictive intelligence leading to anticipating risk patterns powered by proactive data-driven process.

The adoption of Artificial Intelligence and Machine Learning tools in auditing firms has not only transformed how auditors detect risks but also has enhanced the audit quality. In this framework, risk detection acts as a critical variable that leads directly to improving audit quality: The process is sequential.

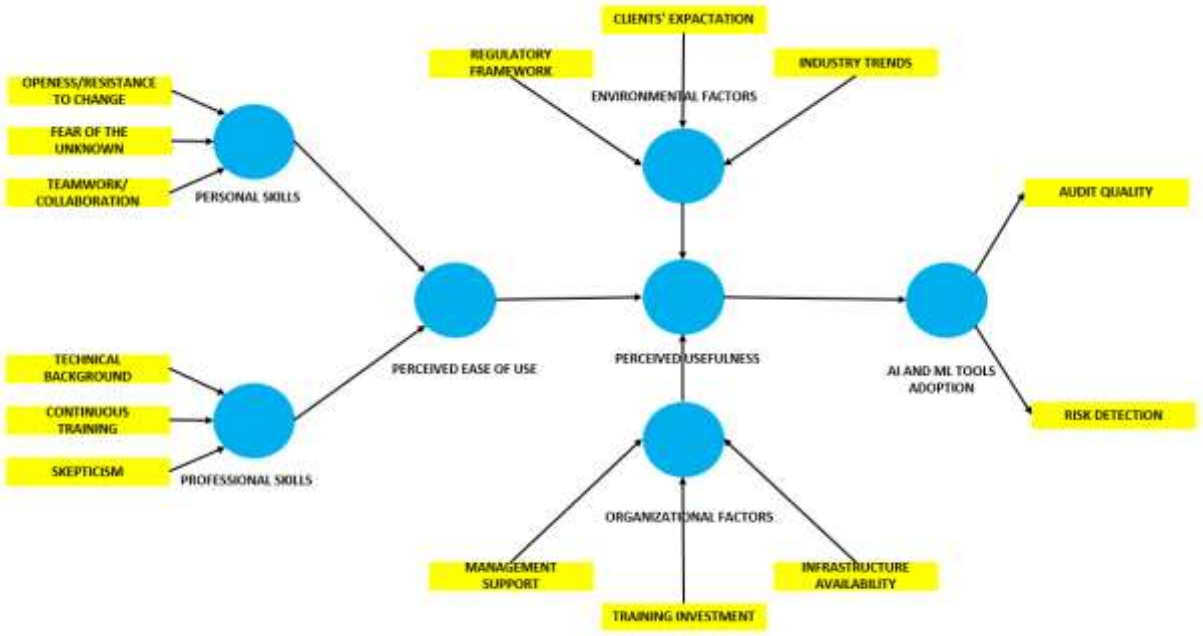
Auditors may detect effectively risks and irregular patterns due to the adoption of new technologies, and this improved risk identification subsequently feeds into higher-quality audit outcomes by combining both computational power and professional expertise.

The use of AI in auditing provides the standardization of audit procedures across clients; it can be programmed to follow protocols to analyze data, which means that all auditors will apply the same methodological rigor without differentiation between the clients' sizes or industries. This standardization minimizes variability in audit approaches due to subjective judgment or individual auditor preferences. Consequently, audit engagements become more structured, and comparable impact later on the audit quality (Kokina et al., 2025).

Many authors confirm that AI have introduced a paradigm shift in auditing by replacing traditional auditing methods. As mentioned earlier, AI allows analyzing large volumes of structured and unstructured data that humans would never have the ability to gather and control (Kokina et al., 2025), which enables reducing human errors due to cognitive limitations. This minimizes the risk of material misstatements and improves the audit conclusions because auditors are able to detect irregularities that don't appear in small samples; the algorithms contribute with the help of critical judgement of auditors to a robust risk-based approach (Riana et al., 2024).

One of the most valuable advantages of AI is its ability to deliver tasks faster by reducing the time spent on routine procedures that normally would take hours or even days of human work. The time reduction enables auditors to be concentrated more on other critical parts of audit instead of spending much time on redoing repetitive operational tasks, this contributes to more accurate conclusions and so a better quality of audits (Riana et al., 2024).

Figure 1: Conceptual model



Source: Authors

This conceptual model explains how the adoption of Artificial Intelligence and Machine Learning tools in auditing is progressively shaped based on two central cognitive constructs and how it ultimately affects audit outcomes. The model is structured around the perceived ease of use and the perceived usefulness of these new technologies, which are considered as key determinants of the process of adopting these tools. Auditors' perceptions of ease of use are formed through their personal skills determined by their resistance or openness to change, their fear of the unknown, and their capacity for teamwork and collaboration: together they have a big influence on how confident auditors feel while using and interacting with technology. Also, professional skills of auditors including technical knowledge and educational background, continuous professional training and critical judgement are together determining auditors' capacity to understand advanced digital tools and using them daily. These two variables shape the perceived ease of use that leads directly to the perceived usefulness of artificial intelligence and machine learning, which depends on organizational factors (management support, investment in training, and availability of technological infrastructure) and environmental factors (regulatory framework, clients' expectations, and industry trends) which create a foundation that directly drives to the implementation of artificial intelligence and machine learning tools in audit practices. Once adopted, concrete outcomes are measured by enhancing audit quality and strengthening risk detection capabilities. In this way, this framework demonstrates how personal, professional, organizational and environmental factors interact together to decide the adoption of artificial intelligence and machine learning in the auditing firms and how this adoption impacts the effectiveness of the audit function.

5. CONCLUSION:

In conclusion, the study offers useful insights into the determinants of AI and ML tools adoption and its impact on audit quality and risk detection.

The research confirms the role of personal and professional skills in influencing the readiness of auditing firms to adopt AI and ML tools. Many factors such as knowledge, expertise, education, and training contribute together to raising the readiness to adopt this new technology. Moreover, the perceived benefits associated with adoption of AI and ML tools have a significant impact that shows a positive correlation between perceived usefulness and the intention to adopt them.

The adoption of AI and ML tools represents a transformative shift in the audit industry; by considering personal and professional skills of auditors, the analysis highlights the human/psychological and technical drivers for this digital transformation.

This research also highlighted the significant impact of processing digital transformation on audit quality and risk detection. AI and ML adoption plays a pivotal role in elevating the audit function in the actual new digital era.

Based on these insights, Moroccan auditing firms should made many considerations for practice to address the challenges posed by this disruptive technology of artificial intelligence. Several investments should be realized in research and development to strengthen artificial intelligence research capabilities through dedicated funding and the creation of centers of excellence and provide more awareness and digital Education to educate the general public on the benefits and risks of this adoption. Additionally, Morocco must also continue to develop a clear and ethical regulatory framework for the use of AI to establish clear guidelines for ethical implementation. This includes the protection of personal data, the transparency of algorithms, and the fight against algorithmic biases (INPPLC, 2022).

While this study focuses on the Moroccan context, further studies could investigate the long-term effects of AI adoption on audit decision-making and also explore comparative analyses across different countries to provide deeper insights into contextual factors influencing AI and ML integration.

By addressing these additional dimensions, future research can contribute to a more comprehensive understanding of the digital transformation of auditing and its implications for the profession.

BIBLIOGRAPHY

(1). Abdullah, A. A. H., & Almaqtari, F. A. (2024). The impact of artificial intelligence and Industry 4.0 on transforming accounting and auditing practices. Journal of Open Innovation: Technology, Market, and Complexity, 10(1), 2-18. https://doi.org/10.1016/j.joitmc.2024.100218

(2). Davis, F. D. (1989). Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology. MIS Quarterly, 13(3), 319-340. https://doi.org/10.2307/249008

(3). Kokina, J., Blanchette, S., Davenport, T. H., & Pachamanova, D. (2025). Challenges and opportunities for artificial intelligence in auditing : Evidence from the field. International Journal of Accounting Information Systems, 56, 100734. https://doi.org/10.1016/j.accinf.2025.100734

(4). L.G, T., & M., F. (1990, janvier). Technological Innovation as a Process. www.researchgate.net/publication/291824703_Technological_Innovation_as_a_Process

(5). Riana, N., Mulyani, S. R., & Aripin, Z. (2024, septembre 3). ASSESSING THE IMPACT OF ARTIFICIAL INTELLIGENCE ON FINANCIAL AUDITING AND RISK ASSESSMENT. KRIEZ ACADEMY: Journal of Development and Community Service, 38-56.

(6). Salaja, M. (2025, octobre). AI and Auditing. https://www.researchgate.net/publication/397001089_AI_and_Auditing

(7). Seethamraju, R., & Hecimovic, A. (2023). Adoption of artificial intelligence in auditing : An exploratory study. Australian Journal of Management, 48(4), 780-800. https://doi.org/10.1177/03128962221108440

(8). Suyono, W. P., Puspa, E. S., Anugrah, S., & Firnanda, R. (2025). Artificial Intelligence in Auditing : A Systematic Review of Tools, Applications, and Challenges. RIGGS: Journal of Artificial Intelligence and Digital Business, 4(2), 3393-3401. https://doi.org/10.31004/riggs.v4i2.1024

(9). Urich Joe Saly, L., & Ektik, D. (2025). Auditors' Opinion About AI and the Impact of AI on Audit Quality : A Study On Qualified Auditors in Africa. https://doi.org/10.5281/ZENODO.15736027

(10). Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User Acceptance of Information Technology : Toward A Unified View1. MIS Quarterly, 27(3), 425-478. https://doi.org/10.2307/30036540