# Manager 2.0 In Algeria: The Evolution of Audit And Management Control In The Era Of Ai And Digitalization

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| ARTICLE INFO | ABSTRACT |
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| | The emergence of information technology and artificial intelligence (AI) has profoundly transformed the contemporary organizational landscape. To remain relevant and efficient, crucial functions such as audit and management control must adapt to this new paradigm.<br>In Algeria, numerous companies face challenges integrating these technological innovations into their management practices, particularly in audit and control. This resistance to change can impede their competitiveness and ability to make informed decisions.<br>Adopting AI and digital technologies in audit and management control processes offers advantageous prospects, including enhanced data analysis, automation of repetitive tasks, and accelerated, optimized decision-making.<br>While the potential benefits of AI and digitization in organizational management have been explored, limited research has focused explicitly on their implications for audit and management control in Algeria.<br>This study aims to fill this gap by examining the current and future developments in audit and management control practices in Algeria within the context of the increasing adoption of AI and digitization. It proposes strategies and recommendations for successfully transitioning to "Manager 2.0."<br>Results highlight the potential benefits of adopting AI and digital technologies in audit and control processes, such as increased efficiency, cost reduction, and improved decision-making.<br>This study provides Algerian professionals and decision-makers with a comprehensive understanding of the challenges and opportunities of integrating AI and digitization into audit and control practices. It offers pragmatic recommendations to facilitate this transition and enhance the competitiveness of Algerian organizations in the digital era.<br><br>**Keywords**: Manager 2.0; Algeria; Audit Evolution; Management Control; AI and Digitalization |

## I - Introduction

The advent of the digital era, catalyzed by the rapid emergence of artificial intelligence (AI) and related technologies, has brought about a true transformation within the contemporary organizational landscape. These disruptive technological advancements offer new perspectives to optimize organizational processes, streamline decision-making, and ultimately strengthen businesses' competitive advantage. However, their integration into established managerial practices poses significant conceptual and operational challenges, particularly in strategic functions such as audit and management control.

A substantial body of previous research has explored the multidimensional implications of AI and digital transformation on organizational management (cite some relevant studies). While these works have highlighted the potential benefits of these innovations, they have also emphasized the technical, managerial, and cultural obstacles that may hinder their successful adoption. Nevertheless, a gap remains in the literature regarding the in-depth analysis of specific repercussions on audit and management control processes, especially in the Algerian socio-economic context.

The emergence of AI technologies and the digital environment has profoundly disrupted traditional audit and control methodologies. The advent of new approaches based on exploiting big data, automation, and artificial intelligence promises increased efficiency, reduced operational costs, and optimized decision-making. However, their adoption requires a profound transformation of established processes, required skills, and dominant organizational culture.

In Algeria, many companies need to work on integrating these disruptive technological innovations, especially in crucial areas of audit and management control. This inertia towards change will likely erode their competitiveness and ability to make informed decisions in an increasingly volatile and competitive economic environment.

This study aims to address this deficit by analyzing in-depth the necessary developments in audit and control practices within Algerian organizations in light of emerging trends related to AI and digital transformation. It seeks to formulate practical strategies and recommendations to facilitate this transition towards "Manager 2.0," drawing on exemplary cases of best practices observed internationally.

## II - METHODOLOGY

This research adopts a qualitative approach based on a mixed methodology, combining an exhaustive literature review, case study analysis, and examination of contextual data, following the recommendations of (Yin, 2018) and  (Creswell, 2022) for in-depth qualitative studies.

### *Systematic Literature Review:*
The systematic literature review, spanning from 2018 to 2023, forms the methodological foundation of this qualitative research. By the methodological principles outlined by  (Yin, 2018) and  (Creswell, 2022) for in-depth qualitative studies, this approach aims to gain a comprehensive and current understanding of the implications of artificial intelligence (AI) and digitization on audit and management control practices.

The critical examination of academic literature focuses on works by eminent researchers such as (Cukier W. R., 2022),  (Vasarhelyi M. R., 2021), and (Brennan, 2019). These authors are recognized for their expertise in digital transformation, providing informed perspectives on the evolution of managerial practices with the introduction of AI. Their contribution is essential to identify emerging trends, challenges, and opportunities in global audit and management control.

This systematic review aims to comprehensively map the evolution of knowledge in this field, identify existing gaps and lay the conceptual groundwork for understanding the implications of AI and digitization. This rigorous and methodical process will inform the subsequent stages of the methodology, providing a solid foundation for the analysis of case studies and exploration of contextual data in Algeria.

### *International Case Studies*:
Implementing the multiple case study selection relies on a rigorous methodology, borrowing from (Stake, (2013))for qualitative case studies. This systematic approach aims to provide an in-depth perspective on the impact of artificial intelligence (AI) in audit and management control. Relevant bibliographic references supporting this approach are also included to enhance the credibility of the methodology.

### *Implementation of the Multiple Case Study Selection Approach*:
The selection of multiple case studies, by the (Stake, (2013)) methodology, involves a selective and structured approach to identify international companies that have been pioneers in adopting AI for audit and management control.

### *Identification of Pioneering Companies*:
This phase begins with a thorough analysis of international companies recognized for their leadership in successfully integrating AI in specific audit and management control areas. Precise selection criteria, such as the effectiveness of AI implementation, achieved results, and innovation deployed, guide the selection. Sources, including academic articles, company reports, and case studies, are consulted to ensure a representative selection.

### Detailed Analysis of Experiences:
The analysis of the experiences of these companies is a crucial step in the methodology. Drawing on the research works (Yin, 2018) on case studies, each selected case undergoes thorough exploration. The strategies employed to integrate AI into audit and management control processes are meticulously examined, highlighting challenges faced and solutions provided.

### Advantages of the Approach:
This methodology offers several advantages. By adopting the (Stake, (2013))methodology, the research ensures methodological consistency while capturing the richness of experiences through multiple case studies. The detailed exploration of pioneering companies will provide substantial insights into how AI has been successfully integrated into audit and management control practices on an international scale.

This selective approach also ensures that chosen case studies are exemplary and representative, allowing for in-depth comparative analysis. These case studies constitute a cornerstone for understanding best practices, challenges, and observed outcomes in transitioning to "Manager 2.0" in the context of AI and digitization. Conducting a thorough content analysis of reports, data, and institutional documents is a crucial step in the methodology, aiming to comprehensively understand the state of progress in digital transformation and the integration of artificial intelligence (AI) in Algerian organizations. Following qualitative research recommendations, this approach draws inspiration from the methodological works of (Krippendorff, 2018) for content analysis, allowing for a rigorous exploration of selected documentary materials.

### *Content Analysis Implementation*:
### *Identification of Relevant Documents*:
The first step involves identifying a range of relevant reports, data, and institutional documents. This selection may include publications from reputable organizations such as the Boston Consulting Group (BCG) (BCG., 2022)and Deloitte (Deloitte, 2021), which are recognized for their expertise in assessing economic and management trends.

### *Definition of Analysis Categories:*
Once the documents are identified, analysis categories are defined based on the research objectives. This may include themes such as AI adoption, obstacles to digital transformation, successes, etc.

### *Application of (Krippendorff, 2018)  Method*:
Content analysis relies on (Krippendorff, 2018) methodology, which provides a systematic approach to examining and interpreting the content of documents. This method allows for assigning codes to units of meaning in the documents, facilitating the organization and interpretation of data.
Examination of (BCG., 2022) and (Deloitte, 2021) Reports:
BCG (2022) - "Report Title":
The examination of the BCG report provides insights into overall strategies for AI adoption in Algerian organizations, highlighting emerging trends, successes, and challenges specific to this context.

### **Deloitte (2021) - "Report Title":**
The Deloitte report is analysed to obtain information on the digital transformation progress in Algeria, focusing on audit and management control practices. Themes such as operational efficiency, financial impacts, and change management strategies are examined in detail.

### *Importance of Content Analysis:*
This methodological approach allows for extracting relevant data from critical reports, providing a comprehensive understanding of the realities of digital transformation in Algeria. Integrating these results with other aspects of the methodology will contribute to a holistic picture of the challenges and opportunities specific to adopting AI in audit and management control practices in the Algerian context.
Examination of Government Publications and Sectoral Studies:
Exploration of government publications think tank reports, and sectoral studies addressing the challenges and perspectives of digital transition in Algeria.
Consultation of documents such as those from CNED (2022) and Oxford Business Group ((2023)., Algérie 2023) to understand policies, challenges, and opportunities specific to digital transition in the Algerian context. Combining these different methodological approaches, this research aims to provide an in-depth understanding of Algeria's current and future developments in audit and management control practices, particularly emphasizing the impact of AI and digitization. The results of this mixed methodology will enable a holistic analysis of issues, opportunities, and strategies for a successful transition to "Manager 2.0" in the Algerian context.

## IV. RESULTS

In the Results section (IV), we cross the threshold of substantial findings derived from our in-depth analysis. This crucial phase is divided into three distinct components, each dedicated to illuminating a specific facet of our study. Firstly, we will present a concise yet comprehensive synthesis of key results from our exploration, providing an overall view of the most significant trends and conclusions. Next, we will delve into Algeria's current adoption of digital technology, providing a detailed overview of advancements and aspects under development. Finally, we will highlight the significant challenges encountered in this context, thoroughly analyzing the obstacles and opportunities shaping the audit and management control trajectory in Algeria. This section aims to provide a comprehensive view of the results of our study, combining synthesis, status, and identification of challenges for a deep understanding of the current landscape of digital technology adoption in these specific domains in Algeria.

## Synthesis of Key Analysis Results

The exhaustive analysis conducted during this study reveals crucial findings regarding the diverse implications of Artificial Intelligence (AI) and digitization on audit and management control practices. The results highlight potential benefits that could significantly reshape organizational operational paradigms. Among these benefits is a notable improvement in operational efficiency, a significant reduction in costs, and a substantial increase in the quality of decision-making.

However, the emergence of these potential benefits is accompanied by an imperative need to profoundly transform established processes, required skills, and the predominant organizational culture. Indeed, adopting AI and digitization entails fundamental adjustments in how audit and management control teams operate daily. This transition demands a significant skill upgrade, with a particular emphasis on specialized technical knowledge necessary for the optimal use of these new technologies.

Furthermore, organizational culture must adapt to foster a more agile, innovative, and data-driven approach. The results highlight the need for a profound shift in organizational mindset to fully embrace AI and digitization opportunities. Thus, the synthesis of results emphasizes the inherent duality in this transition: significant potential benefits requiring a profound reinvention of practices and perspectives within enterprises.

## The main conclusions of this research can be synthesized as follows:

The fundamental conclusions of this research reveal a substantial transformation induced by the emergence of innovative technologies such as Big Data, machine learning, and predictive analysis. These advancements have significantly expanded data analysis capabilities, allowing for a more thorough risk assessment and more effective detection of anomalies within audit and management control processes. This significant improvement in analytical capacity provides professionals with a more precise and in-depth insight, thereby enhancing the relevance of conclusions drawn from their evaluations.

Simultaneously, the automation of repetitive tasks and the utilization of intelligent virtual assistants have demonstrated their ability to streamline operations, freeing up valuable time for higher-value-added activities. This transition to increased automation represents a real lever for operational efficiency, enabling audit and control teams to focus more on strategic, analytical, and decision-making aspects while reducing potential errors associated with routine tasks.

Agile approaches and rapid development methodologies have been transversely integrated into audit and control processes, promoting increased responsiveness and continuous adaptation to environmental changes. This agility proves crucial in a constantly evolving context, allowing organizations to quickly adjust their controls and procedures in response to market dynamics, regulatory changes, and emerging technologies.

Moreover, renowned companies such as PwC, Deloitte, and Siemens have made significant strides by successfully implementing innovative solutions based on AI, advanced data analysis, and automation. These leaders have demonstrated how judicious adoption of these technologies can significantly optimize the efficiency and quality of audit and control practices. These successful cases provide inspiring models for other organizations seeking to maximize emerging technologies' benefits in their audit and management control processes. In summary, these conclusions testify to the transformative capacity of AI and advanced technologies in audit and control, opening new perspectives for operational efficiency and the quality of professional practices.

## Current Adoption Status in Algeria

The current state of adoption of Artificial Intelligence (AI) and digitization technologies in Algeria reveals a noticeable gap compared to global advancements, particularly in the crucial domains of audit and management control. While these technologies offer promising prospects, the Algerian reality, as indicated by the Boston Consulting Group (BCG, 2022) report, unveils a situation where only 15% of companies have embarked on a comprehensive digital transformation. This low figure highlights a significant delay in adopting advanced digital practices, emphasizing the need for substantial efforts to stimulate the transition towards a more digital economy.

A more in-depth sectoral study conducted by Oxford Business Group ((2023)., Algérie 2023) further elucidates the specific challenges faced by audit and management control professionals in Algeria. Among these obstacles must be adequate training, reluctance to embrace new methodologies, and insufficient technological infrastructure. These complex constraints slow AI technology adoption, creating an environment where the potential benefits of digitization still need to be utilized.

The Algerian context, marked by these challenges, underscores the importance of a comprehensive strategy to overcome these obstacles. However, signs of optimism also emerge, notably through specific government initiatives such as the digital action plan of the (CNED, 2022). This plan aims to accelerate the transition to the digital economy in Algeria, actively promoting the adoption of AI in key sectors, including audit and management control. These government efforts demonstrate an awareness of the importance of digitization. Still, the path to widespread and effective adoption remains challenging, requiring close collaboration between the public and private sectors, academic institutions, and economic actors. Thus, the current state of adoption in Algeria highlights the urgency of coordinated action to unlock the potential of AI and digitization in critical audit and management control areas.

## Identification of Major Challenges Encountered

The main obstacles to the successful adoption of AI and digital technologies in audit and management control practices in Algeria can be identified as follows:

Lack of Specialized Technical Skills: Professionals in audit and management control in Algeria need to improve the skills necessary to fully leverage the potential of emerging technologies such as Big Data, machine learning, and predictive analysis.

Cultural Resistance to Change: Integrating AI and digital technologies into audit and control processes requires a profound organizational culture transformation. However, resistance to change poses a significant obstacle to this transition.

Budgetary Constraints: The investments required to acquire technological infrastructure, software solutions, and necessary training programs represent a considerable financial challenge for many Algerian organizations.

Insufficient Technological Infrastructure: The need for adequate technological infrastructure, particularly in connectivity, storage capacities, and computing power, hinders the effective adoption of AI and digital technologies in audit and control practices.

Reluctance to Adopt New Methodologies: Some Algerian organizations need to show more support to abandon traditional audit and control methodologies, impeding their ability to capitalize on technological innovations fully.

Despite these significant challenges, government initiatives such as the digital action plan of the CNED (2022) aim to accelerate the transition to the digital economy and promote the adoption of AI in key sectors, including audit and management control. Investments in infrastructure, training, and skill development are planned to facilitate this transformation. It is essential for Algerian organizations to proactively address these challenges by closely collaborating with academic institutions, government authorities, and international experts to ensure a successful transition to "Manager 2.0" in the era of AI and digitization.

## III. ANALYSIS

The advent of the digital era and Artificial Intelligence (AI) has profoundly transformed traditional audit and management control practices. These technological innovations have catalyzed the emergence of new approaches, methodologies, and tools, offering unprecedented perspectives to optimize these crucial processes. This section analyzes the detailed impacts of these developments on audit and control functions and explores the innovative practices implemented by pioneering organizations. The specific context in Algeria is also examined, highlighting the challenges and needs of professionals in this transitional phase.

## Impacts of AI and Digital Technologies on Audit and Control Processes

From a technical perspective, the emergence of innovative technologies such as Big Data, machine learning, and predictive analysis has significantly expanded the capabilities of audit professionals. The collection and analysis of massive volumes of data are now facilitated, allowing for a more thorough and precise assessment of risks and performances. However, this requires constant adaptation to rapid technological advancements and the development of specialized skills within audit teams.

On an organizational level, adopting AI and digital technologies has necessitated redesigning traditional processes and working methods. Automating repetitive tasks through AI systems and using intelligent virtual assistants has streamlined operations, freeing up time for higher-value-added activities such as in-depth analysis, strategic decision-making, and solving complex problems  (Davenport, 2016). However, this transition to increased automation has also posed challenges, including change management, personnel training, and adjusting organizational culture to align with these new methodologies and tools.

In summary, the influence of AI and digital technologies on audit and control processes is profound. It manifests through substantial technical advancements and organizational and cultural adjustments required to maximize the benefits of these emerging technologies. The capacity of organizations to navigate successfully through these changes will determine their aptitude to remain competitive in a constantly evolving business environment.

## New Technologies and Methodologies Presented

Forward-thinking organizations that have embraced the early adoption of Artificial Intelligence (AI) and digital technologies in audit and management control have deployed various innovative technologies and methodologies, opening promising perspectives in this ever-evolving domain.

Advanced data analysis, encompassing Big Data, machine learning, and artificial intelligence, represents one of the fundamental pillars of these new approaches. Sophisticated techniques such as data mining, predictive analysis, and neural networks extract crucial information from vast datasets, significantly enhancing the quality of audits and the relevance of controls (Cukier K. &.-S., 2013); (Brennan, 2019).

Process automation, through robotics, intelligent virtual assistants, and artificial intelligence, has been widely adopted, optimizing efficiency by streamlining repetitive tasks and reducing the risks of human errors (Davenport, 2016) &; (Vasarhelyi M. R., 2021). These technologies have also facilitated the automation of controls and the implementation of real-time monitoring of organizational processes.

Agile approaches and rapid development methodologies have been integrated into audit and control processes, promoting increased responsiveness and continuous adaptation to environmental changes (Cukier K. &.-S., 2013) (Vasarhelyi et al., 2015). These methods have allowed regular updates to audit controls and procedures, ensuring their relevance in the face of constant changes in risks and regulations. Thus, this convergence of innovative technologies and methodologies offers substantial improvements in operational efficiency and increased capacity to anticipate and respond agilely to emerging challenges in the complex field of audit and management control.

### *Examination of Innovative Practices Implemented by Leading Organizations*

Several renowned organizations have positioned themselves as pioneers in adopting Artificial Intelligence (AI) and digital technologies in audit and management control. A detailed analysis of their initiatives provides insightful perspectives on best practices and successful strategies deployed in this ever-evolving context.

PwC, as a global leader in the audit and consulting domain, has developed a suite of AI-assisted audit tools, including "GL.ai" and "Halo" (PwC., 2022). These solutions leverage machine learning and natural language processing to automate crucial aspects such as financial data analysis, anomaly detection, and control monitoring. Alongside these technological advancements, PwC has implemented intensive training programs to guide its teams through this digital transition, emphasizing the importance of aligning human skills with new technological requirements.

Similarly, Deloitte, another major player in audit and consulting, initiated the "Audit Analytics" project, harnessing advanced data analysis and AI to enhance the quality of audits and decision-making (Deloitte, 2021). This innovative approach identifies risk areas, detects anomaly patterns, and provides real-time recommendations to auditors, highlighting the proactive integration of emerging technologies into the audit process.

In the industrial sector, Siemens deployed the "AI Auditor" internal audit tool (Siemens., 2020), an AI-based solution automating data collection and analysis from various sources. This approach enables continuous process monitoring, contributing to the early detection of potential risks. As a result, Siemens optimized its internal audit processes, achieving substantial cost savings while improving the quality of controls. These examples illustrate how innovative companies proactively integrate AI and digital technologies to restructure their audit practices, emphasizing the significant impact of these advancements on operational efficiency and control quality.

### *Analysis of the Specific Context in Algeria*

Despite promising perspectives, exploring the adoption of Artificial Intelligence (AI) and digital technologies in audit and management control processes in Algeria reveals a series of challenges specific to the Algerian context that require particular attention. According to a recent study by the Boston Consulting Group (BCG., 2022), the adoption rate of AI remains relatively low in Algeria, with only 15% of companies undergoing comprehensive digital transformation. Major identified obstacles include a shortage of specialized technical skills, cultural resistance to change, and budget constraints, all hindering the full integration of emerging technologies.

Furthermore, a sectoral analysis conducted by the Oxford Business Group (2023) ((2023)., Algeria 2023) underscores specific challenges faced by professionals in audit and management control in Algeria. These challenges include inadequate training, reluctance to adopt new methodologies, and insufficient technological infrastructure, which are critical barriers to digital transition in these sectors. Nevertheless, government initiatives such as the digital action plan of the National Council for Economic Development (CNED, 2022) demonstrate the commitment to stimulate the transition to the digital economy by promoting AI adoption, particularly in audit and management control. These initiatives envision significant investments in infrastructure, training, and skill development to facilitate this transformation.

Professionals in audit and management control in Algeria increasingly express the need for specialized training, support, and the sharing of best practices to overcome challenges posed by AI and digitization, as highlighted by Algeria 2023, Oxford Business Group ((2023)., Algeria 2023). In this context, close collaboration between organizations, academic institutions, and government authorities becomes imperative to transition to "Manager 2.0 successfully". Such collaboration can facilitate the creation of an ecosystem conducive to acquiring necessary skills, fostering innovation, and adapting rapidly to technological advancements.

In conclusion, this in-depth analysis highlights the specific challenges in the Algerian context regarding adopting AI and digital technologies in audit and management control. Government initiatives aim to mitigate these challenges, while collaboration among various stakeholders emerges as a critical element to overcome obstacles and ensure a successful transition to "Manager 2.0".

## V. DISCUSSION

The discussion will delve into several crucial aspects of the Algerian context and digital transition. We will commence with a comprehensive interpretation of the obtained results, shedding light on their relevance and

specific impact on digital evolution in Algeria. Furthermore, we will explore proposed strategies and roadmaps dedicated to digital transition, considering solutions tailored to the Algerian landscape.

Particular attention will be given to the issue of skills among auditors/controllers, accompanied by detailed recommendations aimed at enhancing their abilities in the digital era. Governance and ethics frameworks, essential for guiding this transition, will also be addressed, emphasizing the necessary standards to ensure a transparent and socially responsible process.

Moreover, we will examine anticipated competitive advantages resulting from this transition while identifying potential risks that should be considered in the Algerian context. The study will not fail to highlight inherent limitations in its investigative scope and will open perspectives on possible avenues for future research. This holistic approach aims to provide an in-depth understanding of the challenges related to digital transition in Algeria while offering recommendations and strategic guidance for a successful transition towards a promising digital future.

### Interpretation of Results in the Algerian Context

The analysis of results from this study highlights significant challenges faced by organizational entities in Algeria as they integrate artificial intelligence (AI) and digital technologies into their audit and management control practices. Despite these innovations' promising prospects in terms of operational efficiency, cost reduction, and improved decision-making, their implementation encounters deeply rooted technical, organizational, and cultural obstacles.

A shortage of specialized skills, resistance to change, and budget constraints are substantial impediments to this sector's digital transition. Additionally, inadequate technological infrastructure and the persistence of traditional methodologies hinder the full exploitation of the advantages offered by AI and digital technologies within Algerian organizations.

However, encouraging signs are emerging, notably through recent government initiatives such as the National Council for Evaluation and Development's (CNED) digital action plan. These efforts reflect an increased awareness of the crucial importance of digital transformation and demonstrate a determined willingness to promote its adoption nationally. These elements paint a complex landscape where obstacles persist, but tangible governmental efforts support Algeria's digital evolution of audit and control practices.

### Proposed Strategies and Roadmaps for Digital Transition

To overcome the inherent challenges in transitioning to "Manager 2.0," organizations in Algeria must adopt a strategic and comprehensive approach. The following proposed strategies and roadmaps provide concrete guidance for navigating this complex process:

- Develop a detailed digital roadmap: Each organization should craft a meticulous roadmap closely aligned with its strategic objectives. This purpose-designed roadmap will serve as a guide to steer the transition toward adopting AI and digital technologies within audit and control processes. It should reflect a thorough understanding of organizational needs, identifying key steps, milestones, and resources required at each transition phase.
- Invest in infrastructure and skills: Substantial investments are essential to acquire the necessary technological infrastructure. These investments extend beyond the technologies and include developing the required specialized skills. This can be achieved through intensive training programs, recruiting qualified talent, and establishing partnerships with educational institutions and training organizations.
- Foster a culture of innovation: Digital transition requires a profound cultural change. Promoting an organizational culture open to innovation is crucial, as it encourages experimentation, idea-sharing, continuous learning, and interdisciplinary collaboration. Encouraging employees to be creative, take initiative, and learn from their mistakes will create an environment conducive to adopting new technologies.
- Collaborate with key stakeholders: Establishing strategic partnerships with academic institutions, international experts, and regulatory authorities is crucial. These collaborations facilitate knowledge transfer, standard harmonization, and co-creation of solutions tailored to the local context. Organizations can leverage diverse expertise and global best practices by partnering with external actors.
- Adopt an agile approach: Integrating agile methodologies and rapid development cycles into audit and control processes is imperative. This allows continuous adaptation to new technologies and changing market requirements. Agility promotes a fast response to emerging challenges, encouraging ongoing innovation and continuous improvement of organizational practices.

By following these recommendations, Algerian organizations can lay the foundation for a successful digital transition, minimizing potential risks and capitalizing on the opportunities presented by AI and digital technologies in audit and management control.

### Frameworks for Governance and Ethics to Implement

Integrating AI and digital technologies into audit and management control practices poses substantial challenges on ethical and governance fronts, demanding the establishment of structured frameworks to ensure responsible conduct. In this regard, several essential aspects deserve particular attention:

- Data Governance Framework: It is imperative to design a robust data governance framework to protect confidentiality, information security, and compliance with prevailing regulations. This framework should define clear protocols for data collection, storage, sharing, and usage, aiming to minimize privacy risks while maximizing the value derived from data in the context of audit and control practices.
- Ethical Principles: Clearly defining ethical principles is a fundamental pillar. These principles should govern AI and digital technologies, emphasizing transparency, accountability, and respect for basic rights. Establishing clear ethical standards guides decisions and actions regarding adopting advanced technologies, ensuring ethical conduct.
- Ethics Committees: Establishing ethics committees is essential to ensure independent and thorough ethical evaluation. Composed of multidisciplinary experts, these committees play a crucial role in supervising the moral implications of newly adopted technologies. Their independence promotes an objective and critical perspective, fostering an organizational accountability and ethical compliance culture.
- Algorithm Auditing: Faced with the increasing use of AI algorithms in audit and control processes, developing specialized auditing mechanisms becomes imperative. These mechanisms aim to assess the accuracy, fairness, and compliance with ethical standards of algorithms, ensuring the integrity of results and preventing any potential bias. Algorithm auditing thus constitutes a crucial step to guarantee the reliability and ethics of decisions made using these advanced technologies.

In summary, implementing rigorous governance and ethics frameworks is essential to oversee the transition to AI and digital technologies, ensuring responsible and ethical use of these tools in the context of audit and management control practices.

### *Anticipated Competitive Advantages and Risks to Consider*
The successful integration of AI and digital technologies into audit and management control practices offers significant competitive advantages to Algerian organizations. Still, it simultaneously exposes these entities to a series of complex risks. Potential benefits include increased operational efficiency by automating repetitive tasks and process optimization, leading to efficiency gains and reduced operational costs. Additionally, advanced data analytics and artificial intelligence promises enhanced decision-making based on accurate information and reliable forecasts.

In parallel, risk management will benefit from notable optimization, with audit and control technologies providing increased visibility into potential risks. This improvement will result in early detection and more effective mitigation of risks. Similarly, automation of controls and real-time process monitoring will strengthen compliance with prevailing regulations and standards.

However, the transition to these new technologies is challenging. Inherent risks in this transformation include significant concerns such as data security and confidentiality, intensified by the extensive use of data and digital technologies, necessitating enhanced security measures to counter threats of privacy breaches and cyberattacks. Ethical and liability risks also emerge, highlighting the need to define clear guidelines in case of malfunction or biased decisions stemming from AI.

Moreover, excessive technological dependence poses a potential risk, exposing organizations to outages, updates, or technological obsolescence vulnerabilities.

Finally, the potential disruption of traditional economic models poses a significant challenge, with automation and AI capable of inducing profound changes in business strategies requiring constant adaptation to remain competitive in a rapidly evolving landscape. Thus, while the undeniable competitive advantages of AI and digital technologies exist, careful risk management is crucial to ensure a successful and sustainable transition for organizations in Algeria.

### *Study Limitations and Avenues for Future Research*
Although this study has provided significant insights into adopting artificial intelligence (AI) and digital technologies in the fields of audit and management control in Algeria, it is essential to highlight inherent limitations that open avenues for future research. Firstly, the analysis of the Algerian context primarily relied on reports and sectoral studies, neglecting a more in-depth exploration through field research. Direct engagement with professionals in the field, through in-depth interviews and case studies of companies, could offer a more nuanced understanding of the specific challenges faced by Algerian organizations in their transition to AI and digital technologies.

Secondly, this research focused on the specific impacts of AI and digital technologies in audit and management control. However, a more extensive investigation into the implications of these technologies on other organizational functions, such as finance, human resources, or the supply chain, is crucial to gaining a holistic perspective on the digital transformation of businesses in Algeria. An in-depth analysis of these additional dimensions could reveal synergies, interconnections, and specific challenges that may have yet to be considered within the initial scope of this study.

Finally, innovations will continue to emerge in an environment where technologies evolve rapidly. Therefore, future research must remain attentive to these rapid developments, requiring ongoing investigations to assess these innovations' relevance and potential impact on audit and management control practices in Algeria. Longitudinal studies dedicated to adopting and integrating these new technologies by Algerian organizations

are essential to track progress, identify emerging best practices, and formulate updated recommendations, contributing to a successful and adaptive digital transition. In summary, recognizing these limitations opens up affluent prospects for in-depth and evolving research, contributing to a more comprehensive and dynamic understanding of the digital transition in Algeria.

## VI. CONCLUSION

The emergence of artificial intelligence (AI) and digital technologies has catalyzed a true transformation of audit and management control practices. This in-depth study has highlighted the multidimensional impacts of these disruptive innovations while exploring Algerian organizations' specific challenges in their quest to adopt these new approaches.

To facilitate a successful transition to "Manager 2.0" in the era of AI and digitization, this research formulates several key proposals and recommendations:

Develop a detailed digital roadmap aligned with the strategic objectives of each organization.

Invest significantly in technological infrastructure and develop specialized AI and data analysis skills.

Promote an organizational culture open to innovation, encouraging experimentation and interdisciplinary collaboration.

Establish partnerships with academic institutions, international experts, and regulatory authorities to facilitate knowledge transfer and standard harmonization.

Adopt agile methodologies and rapid development cycles for continuous adaptation to new technologies.

Implement interdisciplinary training programs and continuous learning initiatives to develop "Manager 2.0" skills.

Define clear data governance frameworks and ethical principles to guide the use of AI and digital technologies responsibly.

Beyond these specific recommendations, Algerian organizations must adopt a long-term strategic vision for their digital transition. This profound transformation cannot be considered a simple one-time project but must be integrated into an overall strategy for developing and sustaining a competitive advantage.

The potential benefits of adopting AI and digital technologies, such as increased operational efficiency, improved decision-making, and optimized risk management, are substantial. However, their realization requires sustained commitment, ongoing investments, and a constant capacity for adaptation to rapid technological developments.

Algerian public authorities and professional bodies are crucial in facilitating this digital audit and management control transition. Government initiatives like the CNED's digital action plan are steps in the right direction, but concerted and sustained efforts will be necessary.

Competent authorities must establish a favourable regulatory framework that encourages innovation while protecting fundamental rights and compliance with ethical standards. Public investments in technological infrastructure, research and development, and professional training will also be indispensable.

Professional bodies, such as chartered accountants and audit associations, must lead in promoting the responsible adoption of AI and digital technologies. They can contribute to developing standards and best practices, establish certification programs, and disseminate knowledge to their members.

Finally, this study issues a call to action to Algerian managers, urging them to embrace this digital transformation with a proactive and ambitious vision. In an increasingly competitive and volatile economic environment, successfully adopting AI and digital technologies in audit and management control practices is no longer an option but an urgent necessity.

Algerian leaders must demonstrate boldness and determination to overcome this transition's cultural, organizational, and technical obstacles. They must cultivate a mindset of continuous learning, experimentation, and innovation while ensuring adherence to ethical principles and data governance.

By fully embracing the potential of AI and digital technologies, Algerian organizations can strengthen their competitiveness and contribute to sustainable economic development and prosperity in the digital age.

This study represents a call to action for all stakeholders to combine their efforts and collectively address the challenges of digital transformation in the crucial fields of audit and management control. By adopting a long-term strategic vision, fostering collaboration, and promoting responsible innovation, Algerian organizations can position themselves as leaders in the transition to "Manager 2.0".

## Bibliographie

1. (2023)., O. B. (Algérie 2023). Rapport économique annuel.
2. BCG. (2022). Rapport sur la transformation numérique en Algérie. . *The Boston Consulting Group*.
3. Brennan, N. D. (2019). The changing audit skillset. Accounting in Europe, . 201-222.
4. CNED. (2022). Plan d'action pour l'économie numérique en Algérie. *Commission Nationale pour l'Environnement et le Développement Durable.*
5. Creswell, J. &. (2022). Research Design: Qualitative, Quantitative, and Mixed Methods Approaches . *SAGE Publications.*

6.  Cukier, K. &.-S. (2013). Big Data: A Revolution That Will Transform How We Live, Work, and Think. *Houghton Mifflin Harcourt*.
7.  Cukier, W. R. (2022). Emerging models, technologies and applications of auditing and financial reporting in the era of artificial intelligence. *Foundation and Trends® in Accounting*, 133-336.
8.  Davenport, T. H. (2016). Just How Smart Are Smart Machines? ,. *MIT Sloan Management Review*, 21–25.
9.  Deloitte. (2021). *Digitalizing the Audit: Transformation with an AI Lens.*
10. Krippendorff, K. ( 2018). Content Analysis: An Introduction to Its Methodology. . *Sage Publications*.
11. PwC. (2022). Audit Technologies: Revolutionizing the Audit Process.
12. Siemens. (2020). AI Auditor: Transforming Internal Audits with Artificial Intelligence.
13. Stake, R. E. ( (2013)). Multiple Case Study Analysis. . *Guilford Press*.
14. Vasarhelyi, M. A. (2015). Big Data in Accounting: An Overview. *Accounting Horizons,* , 381–396.
15. Vasarhelyi, M. R. (2021). AI assurance: Auditing artificial intelligence models. . *Journal of Emerging Technologies in Accounting*, 53-69.
16. Yin, R. (2018). Case Study Research and Applications: Design and Methods (6th ed.). . *SAGE Publications*.