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Barriers to the integration of artificial intelligence in public sector internal audit in Morocco: An exploratory study

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Abstract: Integrating Artificial Intelligence (AI) into the internal audit functions of the public sector poses certain challenges, hindering its usage. The purpose of our study is to identify and understand the main factors hindering the integration of this advanced technology within the internal audit functions of the Moroccan public sector. Using an interpretivist approach and qualitative methodology, we applied the Technology-Organization-Environment framework and collected data through semi-structured interviews with 14 public sector internal auditors. Firstly, from a technological point of view, the major barriers encompass the incompatibility of the technological infrastructure, the absence of adequate technological skills, and the complexity of AI. Secondly, in the organizational context, major barriers are the investment cost and the nature of the public sector's activities. Finally, on the environmental level, the absence of a clear regulatory text and adequate technical assistance are barriers hindering AI integration. Addressing these obstacles is key to a successful integration of AI within internal auditing in Morocco's public sector, enabling a better quality of public sector audits. This study contributes to the literature on AI in auditing by providing an empirical perspective on the perceived barriers in developing countries' public sectors.

Keywords: *Artificial intelligence, Internal auditing, Public sector, TOE framework.*

1. Introduction

Organisations all over the world are witnessing an increasing level of institutional complexity and economic circumstances. Regarding this matter, Internal auditing is essential to organisations, with its value-added by offering an impartial assessment of governance, risk management and systems of internal control [1]. In addition, internal auditing functions and procedures must change to face the expanding scope of operations, and to stay current, efficient, and proactive.

Regarding this dynamic transformation, technological advances are becoming more strategic. According to recent research, there are two trends in internal auditing: the gradual digital transformation of instruments and procedures and the usage of cutting-edge technologies into auditing procedures. Due of its capacity to automate repetitive tasks, generate predictive analyses, and enhance the quality of expert judgments, artificial intelligence (AI) stands out among these innovations as one of the most promising technologies [2].

However, and despite its potential, the usage of AI in internal auditing, especially in the public organisations is limited and it's integrated slowly. This slow integration, according to Yang, et al. [3] is due to technological, organisational and institutional constraints faced by the public organisations. The case of Morocco's public sector is reflective to these constraints, where internal auditing is assuming a more important role in the management of the public management and the governance of resources.

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Our study's aim is to understand the perception of public sector internal auditors regarding the barriers that impede the integration of AI in their functions, based on the Technology-Organization-Environment paradigm [4]. Building on an exploratory qualitative method, this study offers an organized and contextualized understanding of the barriers internal auditors perceive, drawing on the Technology-Organization-Environment theoretical framework. It seeks to close two gaps: the first is a thorough comprehension of the opposition to the application of AI in internal auditing, and the second is the dearth of empirical studies grounded in the Moroccan environment.

To reach our goal, we explored a key question: What are the main barriers to integrating artificial intelligence into internal auditing within Morocco's public sector?

To answer this and meet our study's objectives, this work is structured around four main axes. In the first, we present explanations about the Technology-Organization-Environment framework. The second line of research focuses on a comprehensive analysis of the relevant literature, with the aim of identifying the factors influencing the integration of artificial intelligence in the field of internal auditing. The third axis focuses on the methodology we adopted to conduct out research. The last two axes present respectively the qualitative data analysis and the discussion of the findings.

2. The Technology-Organization-Environment Framework

Over the years, researchers in the field of information technology have developed different theories and models to help understand what drives or impedes the use, adoption and post-adoption of technology, whether on an individual or organizational scale.

In this vein, the Technology Acceptance Model (TAM), the Unified Theory of Acceptance and Use of Technology (UTAUT) and the Technology-Organization-Environment (TOE) framework are some of the most used theories in the field. As such, the TOE framework has been extensively used by researchers and has been examined by empirical qualitative and quantitative research on different technological innovations and different contexts to understand technology adoption [5, 6].

The TOE framework has been introduced in the "The processes of technological innovation" book [4]. Considering the different contexts, technological, organizational, and environmental, this model identifies the major factors influencing the adoption and use of technologies by organisations. The adoption of technological innovation is thought to be influenced by these three contexts [6].

The first level is technological context. It includes all the technologies that are pertinent to the organization, whether they are already used in the organization and are available but not yet implemented [7]. Technologies that an organization is already using are included in the adoption process, as they considered as a general limit to the extent of technological change an organization can achieve. They affect innovation too, with innovations not yet adopted by the firm helping to shape it. On the one hand, they define the limits of what is possible. On the other, they show organizations how technology can enable them to evolve and adapt [8].

A second context in the TOE framework is the organizational context. It covers several characteristics of the organization and is related to the resources of the organization, including its size, structure, procedures, human resources, other resources and links with other organizations [9].

The final TOE context is the environmental context. According to Tornatzky and Fleischer [4] the environmental level describes the environment in which the company operates, including industry, competitors and relations with public authorities. Baker [8] adds that this context is also linked to the presence (or absence) of technology service providers. Thus, Junior, et al. [9] indicate that industry composition and macroeconomic aspects are part of the environmental context.

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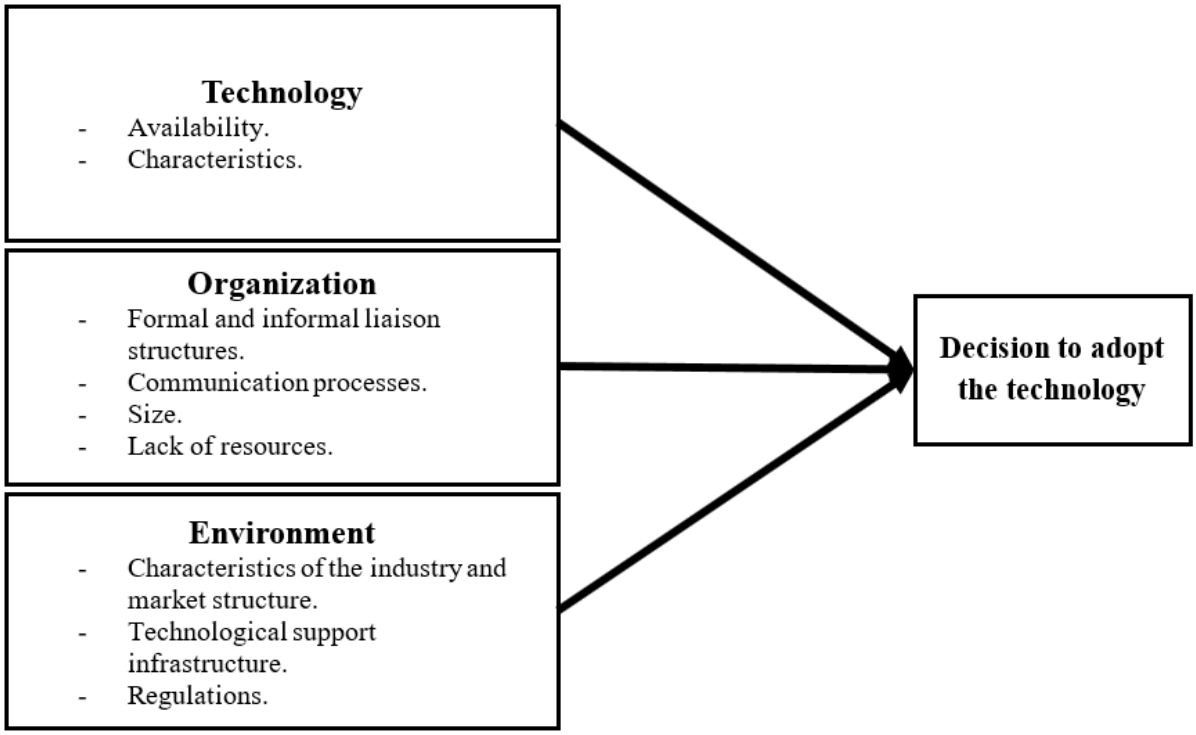

Figure 1.
Technology-Organization-Environment Framework.
Source: Adapted from Baker [8].

3. Background and Literature Review

One of the most significant technologies that businesses around the world are considering is artificial intelligence (AI). The term artificial intelligence (AI) refers to a broad range of methods for teaching computers to carry out tasks that call for human intelligence. According to Alsheiabni, et al. [10] artificial intelligence (AI) encompasses a wide range of fields, including robots, expert systems, deep learning, and machine learning.

The aim of our study is to investigate the barriers internal auditors face while implementing and utilizing AI. The term "barriers" describes elements that impede how an organization adopts technology [11]. Many researchers have employed the TOE framework to investigate adoption, post-adoption, as well as barriers and obstacles to technology adoption in various contexts using a variety of qualitative, quantitative, and mixed methods approaches as the initial publication of Tornatzky and Fleischer [4]; Alsheiabni, et al. [10] and Baker [8].

The theoretical framework used for determining the elements influencing the acceptance of technical advancements is the TOE framework [4]. In fact, it helps researchers identify the elements that encourage acceptance as well as the barriers to its application. The TOE framework has been utilized by several scholars to examine how auditors use technologies like blockchain, artificial intelligence, big data, and other technical advancements.

Seethamraju and Hecimovic [12] investigated the usage of AI in auditing using the TOE framework. They concluded that AI could enhance audit quality and offer the company value-added services. However, because of the absence of control offered by the AI "black box," which is susceptible to audit quality scrutiny, the use of AI necessitates a re-examination of auditing procedures.

In this paper, Seethamraju and Hecimovic [12] have identified factors that impede technology integration within the auditing profession. The organisational context in this study includes variables like knowledge, data quality, readiness and trust. Secondly, the organisational context is marked by

barriers such as the client's readiness, auditing standards, and regulations. These barriers are specifically related to people's capacity to assess the variables affecting and impeding the integration of technologies.

Accordingly, the study by Yang, et al. [3] adds the size of the organisation and its communication procedures as variables affecting the adoption of AI technologies in auditing. They added that the "anticipated changes in the business sector" is the one factor affecting the adoption decision as of the environmental context.

Torroba, et al. [13] have also conducted a study on the factors that influence and impede AI and data analytics by auditors in Spain. Their mixed methods study, based on 130 auditors and 20 interviewees, shows that the need for a clear regulatory framework to govern the application of AI and Data Analytics is a major factor driving the implementation in auditing. Accordingly, a major obstacle to the adoption of data analytics and AI is the absence of this framework. In addition, given the lack of adequate understanding of Data Analytics and AI, the findings reveal that auditors' lack of training is another technological obstacle impedin the implementation of these technologies. Additionally, the widespread adoption of these cutting-edge technologies is hindered by auditing firms' lack of trust in the application of data analytics and AI, albeit to a lesser extent.

Research on AI adoption by internal auditors on the organisational level is scarce. Nevertheless, a significant number of researchers are using the TOE framework to study the adoption and use of other kinds of technology in this context. Among these studies, the study by Leo, et al. [14] focused on the determinants of the intention to use Big Data Analytics in the context of remote audits during the COVID-19 period. The results of this research indicate that organizational factors are the only ones that correlate with the intention to adopt. Environmental and technological factors therefore do not appear to have an impact on the latter.

Similarly, Li, et al. [6] conducted a study to understand the value of using data analytics in internal auditing. For this study, the researchers targeted a sample of 209 junior and senior internal auditors, audit department heads, IT auditors, and Data Specialists, etc. The analysis highlights that among the technological factors, only the level of technological competence favours this use, unlike IT complexity, which has no notable effect. Among the organizational factors, only managerial support has a positive effect, while the size of the structure is not significant. Furthermore, encouragement through regulatory standards was identified as a factor stimulating the adoption of audit analysis tools, while professional assistance was found to influence functional use. Application use, as a catalyst for functional use, plays a crucial role in optimizing internal audit performance, highlighting the strategic value of these tools [6].

Gökoğlan, et al. [15] indicate that AI powered inspection systems provide significant advantages to internal auditors. They reduce time and cost of audits, accelerate the process of data collection analysis which in turn reduce the human effort. Consequently, the overall cost of audits is reduced. In this vein, Qatawneh [16] indicates that AI for internal auditing allows a higher accuracy, time saving, improved efficiency, improved fraud detection and a higher overall quality of audits. The authors suggest that AI based auditing system should be designed in compliance with the regulatory bodies and respect the principles of accountability. Other researchers such as Leocádio, et al. [17] have emphasised the importance of a regulatory framework for the successful use of AI by internal auditors.

In the following table, we offer a synthetic overview of the aforementioned works. This summary categorizes the various factors identified in the literature according to the three contexts of the TOE framework by Tornatzky and Fleischer [4].

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Table 1.
Summary of factors affecting the use of AI in auditing.

Context	Identified Factors	Sources
Technological	• Technological Competence • Computational Complexity • Technological Maturity • Perceived Benefits • Compatibility • Lack of auditor training • Level of knowledge of AI and data	Li, et al. [6]; Seethamraju and Hecimovic [12] and Torroba, et al. [13].
Organizational	• Managerial Support • Organizational Preparation • Data Quality • Internal Confidence in AI • Internal Communication • Organization Size	Leo, et al. [14]; Li, et al. [6]; Seethamraju and Hecimovic [12] and Yang, et al. [3].
Environmental	• Specific Regulatory Framework • Audit Standards • Regulations in force • Client Readiness Level • Changes in the business sector • Professional assistance	Li, et al. [6]; Seethamraju and Hecimovic [12]; Torroba, et al. [13] and Yang, et al. [3].

Despite the rich body of previous work using the TOE framework to explore the factors influencing the adoption of technological innovations such as AI in auditing, several limitations remain. On the one hand, most of the studies identified focus on external auditing, leaving internal auditing relatively unexplored, particularly in specific contexts such as developing countries. On the other hand, most existing research is conducted in Anglo-Saxon or European contexts, without considering the specific economic, cultural, and regulatory characteristics of other regions, such as Morocco.

Furthermore, while some studies identify barriers to AI adoption, few of them adopt a holistic approach anchored in the TOE framework to thoroughly analyse the obstacles to the effective use of AI in internal auditing. This gap is even more significant in a context where internal audit plays an increasingly strategic role in the governance of Moroccan organizations [18], but where the integration of advanced technologies remains slow [19].

It is in this perspective that the present research is situated, the objective of which is to understand the factors hindering the use of AI in the context of internal audit in Morocco, through the lens of the TOE framework. This study thus aims to fill a double void: that of a detailed understanding of the barriers to the use of AI in internal audit, and that of the absence of empirical research contextualized in Morocco, mobilizing a robust theoretical framework.

4. Research Methodology

The aim of this study is to understand the obstacles to the adoption of artificial intelligence in internal audit work in the Moroccan public sector.

To achieve this objective, an interpretivist epistemological stance was adopted, and the qualitative empirical method was used for the study, to obtain in-depth descriptions and interpretations, directly related to the research question. In this perspective, we opted for the interview as a data collection tool, and more specifically the semi-structured interview.

Individual interviews were conducted with internal auditors from the Moroccan public sector, to identify their perception regarding the adoption of AI in their work, and the factors that hinder this use. We stopped at 14 internal auditors in accordance with the principle of theoretical saturation established

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by Pires [20] in his article entitled: Sampling and qualitative research: theoretical and methodological essay.

The interviews were conducted using an interview guide structured around three main themes, directly derived from the Technology-Organization-Environment framework of Tornatzky and Fleischer [4]. These axes allowed us to guide the discussion while leaving room for spontaneity, since the participants were able to address the themes freely or in response to the questions asked. Each interview lasted between 35 and 55 minutes, thus providing sufficient time to thoroughly explore the perceptions and experiences of the respondents.

Once the data had been collected, a thematic analysis was carried out using the mirror effect method. The methodological approach we adopted consists of analysis of discourse, which is, generally, based on interpretative texts and summary tables. According to Krief and Zardet [21] it facilitates the identification the main barriers to the integration of AI in the internal auditing functions by the identification of frequently recurring themes, the classification of data, and the subsequent presentation of results in a narrative form.

5. Results analysis

In our research, we adopted a research methodology which is based on thematic analysis of qualitative data gathered by means of semi-structured interviews. This investigation helped us understand how internal auditors of the public sector perceive the barriers to the implementation of AI in their profession. We based our research on the TOE framework to achieve our aim.

As a first step of our investigation, we tried to explore the potential advantages of AI usage according to internal auditors. Although we concluded that there is no real use of AI in our context, internal auditors are nevertheless aware of the potential benefits and advantages it could bring. According to them, the integration of AI into internal audit processes would improve the quality of the work carried out, better comply with the audit plan, and facilitate the transition to more modern and proactive audit approaches. However, several barriers and obstacles remain, slowing down the adoption of these technologies by professionals in the sector.

Table 2.
Verbatims related to the "benefits of using AI in internal audit".

Interviewee	Verbatims
Theme: Advantages of Using AI in Internal Audit	
Interviewee 1	"The integration of technology into the internal audit process is imperative, given the technological advancements and human demand underpinning this major transition."
Interviewee 3	"Artificial intelligence represents a major opportunity to improve the quality of our internal audit processes. Indeed, it allows for more in-depth analyses while automating repetitive and low-value-added tasks."
Interviewee 11	"I am convinced that to optimize the quality of our audits and achieve a higher level of precision, we must adopt specialized technological tools for internal audit and integrate artificial intelligence, like our counterparts in developed countries."

The following table lists all the factors identified from our analysis, which are considered to be obstacles to the adoption of artificial intelligence (AI) in the field of internal audit, according to the TOE model.

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Table 3.
Thematic analysis results.

Theme	Sub-theme
Technological Context	• Technological infrastructure incompatibility • The lack of skills • Complexity
Organizational Context	• The cost of investment • The nature of the activity
Environmental Context	• The absence of a regulatory framework • The lack of technical support

Theme 1: Technological Context

The first emerging theme from our qualitative analysis focuses on the technological barriers hindering the adoption of AI in internal audit work, through 3 sub-themes, namely the technological infrastructure incompatible with AI technologies, the lack of technological skills, and finally the complexity of AI for all public servants, including internal auditors.

Sub-theme 1.1: Technological Infrastructure Incompatibility

Technological infrastructure is essential for successfully integrating AI technologies into the work of internal auditors. However, the absence or incompatibility of information systems with these technologies represents a major constraint for exploiting the potential of AI by all staff and internal auditors.

Table 4.
Verbatims related to " Technological Infrastructure Incompatibility".

Interviewee	Theme: Technological Context
Sub-theme: Technological Infrastructure Incompatibility	
Interviewee 14	"It is not possible to opt for AI in internal audit in an organization marked by the lack of an information system connecting the various departments and functions."
Interviewee 5	"Senior management has deployed several innovative systems to optimize the operational efficiency of public servants. However, I am not convinced of the feasibility of integrating technologies such as AI into our current systems. We absolutely must implement new systems in order to be able to integrate them."

5.1. Sub-theme 1.2: Lack of skills

The technological competence of staff is essential for the successful use of these technologies. For successful adoption of information technologies, it is essential that teams have the necessary skills.

In our context, the lack of skills is one of the factors slowing down the integration of AI technologies into internal audit processes.

In this perspective, the interviewees emphasize that the lack of technological skills is a major obstacle to the adoption of artificial intelligence. They recommend, on the one hand, the integration of information technology specialists within internal audit functions, and on the other hand, the implementation of continuing education programs. These two levers are perceived as essential to accelerate the effective integration of AI into audit practices.

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Table 5.
Verbatims related to "lack of skills"

Interviewee	Theme: Technological Context
Sub-theme: Lack of skills	
Interviewee 2	"It is imperative that auditors master the fundamentals of data science techniques and have a good understanding of Machine Learning algorithms. They must also be able to use advanced data analysis tools. They must develop skills in technology risk management and digital ethics, in order to optimally supervise the use of AI in their missions."
Interviewee 8	"It is necessary to upgrade the skills of internal auditors in modern technologies in the face of rapid developments in AI, Big Data, and data analysis."
Interviewee 4	"In my opinion, internal audit teams must evolve towards new working methods, involving the use of technologies, and especially those that can increase the quality of our work. To achieve this, it will be necessary to recruit talent specialized in information technology within our teams."

5.2. Sub-theme 1.3: Complexity

Artificial intelligence is perceived by our interviewees as a promising solution to improve the quality of internal audit work. However, the inherent complexity of these technologies constitutes a significant obstacle to their appropriation, making their use difficult and thus hindering their effective adoption by internal auditors.

Table 6.
Verbatims related to "complexity".

Interviewee	Theme: Technological Context
Sub-theme: Complexity	
Interviewee 10	"I am not an IT expert, and my knowledge of artificial intelligence remains limited. In my situation, and I think this is the case for many others, the use of AI is not obvious. At this stage, we are still far from a real and operational adoption of this technology."

5.3. Theme 2: Organizational Context

The second emerging theme from our qualitative analysis focuses on the organizational factors hindering the adoption of AI in internal audit work, through 2 sub-themes, namely the high investment cost, and the nature of public sector activity.

5.4. Sub-Theme 2.1: The Cost of Investment

Integrating artificial intelligence within organizations represents a significant investment, mobilizing considerable financial resources. Due to this high cost, many organizations may perceive the adoption of AI with caution, questioning its return on investment, particularly in specific functions such as internal audit.

Table 7.
Verbatims related to "investment cost".

Interviewee	Theme: Organizational Context
Sub-theme: The cost of investment	
Interviewee 9	"The acquisition of an AI system is a significant investment, requiring a substantial budget. I do not believe that in the current context, it is possible to resort to such an investment."
Interviewee 6	"The integration of AI can require significant investments in terms of technology, training, and personnel, which can represent a challenge, particularly for organizations with limited resources."

5.5. Sub-theme 2.2. The Nature of the Activity

Most internal auditors interviewed agree that the nature of the activity is a barrier to the use of artificial intelligence in their work. Indeed, public organizations have the mission of meeting the needs of citizens and providing public services, generally free or almost free, without a profit motive. In this context, internal auditors mainly handle data with a strong qualitative component, which is unstructured and difficult to automate using current AI systems.

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Table 8.
Verbatims related to "the nature of the activity".

Interviewee	Theme: Organizational Context
Sub-theme: The nature of the activity	
Interviewee 2	"Our organization is a socially oriented entity. The information we have is qualitative in nature, due to the nature of our activities. Therefore, the auditor's professional judgment is essential and cannot be replaced by an intelligent system."

5.6. Theme 3: Environmental Context

The third theme emerging from our qualitative analysis concerns the environmental factors slowing down the adoption of AI in internal audit work, through 2 sub-themes, namely the absence of a clear regulatory framework governing the use of AI by public organizations, as well as the lack of technical support.

5.7. Sub-Theme 3.1: The Absence of a Regulatory Framework

The public sector is an area of activity heavily regulated by legal texts and strict regulations. In this context, the lack of a specific regulatory framework governing the use of artificial intelligence is one of the main obstacles to its integration, particularly within internal audit functions.

Table 9.
Verbatims related to "the absence of a regulatory framework".

Interviewee	Theme: Environmental Context
Sub-theme: The absence of a regulatory framework	
Interviewee 7	"As internal auditors in the public sector, we cannot use techniques or technologies as long as there is no legal framework governing them. To my knowledge, no public body has adopted these AI technologies in a context marked by such a regulatory void."
Interviewee 6	"AI technologies are now an essential element of today's business landscape. However, in the public sector, their adoption remains difficult in the absence of a clear legal framework governing their use. This constraint, although it may hinder innovation, acts as a safeguard for public officials and contributes to the preservation of public funds."

5.8. Sub-Theme 3.2. The Lack of Technical Support

Technical support relies on access to and the relevance of qualified assistance for the use of AI. Our discussions with internal auditors indicate that one of the main barriers to AI adoption lies in the inability to obtain timely professional assistance, attributable to the lack of qualified personnel in the field of AI.

Table 10.
Verbatims related to "the lack of technical support".

Interviewee	Theme: Environmental Context
Sub-theme: Lack of technical support	
Interviewee 13	"As I've already mentioned, the adoption of AI in our sector of activity is proving complex, particularly due to our lack of internal resources specialized in AI. These specialists would be essential for overcoming the challenges posed by the use of these technologies."

6. Findings Discussion

The analysis of the results from the semi-structured interviews conducted with internal auditors in the Moroccan public sector highlighted several obstacles to the adoption of AI. These obstacles, classified according to the three dimensions of the Technology-Organization-Environment framework [4] partly echo the findings of the existing literature, while highlighting specificities of the public sector context and the Moroccan system. In this section, we try to shed the light on the results of our study, by contrasting them with the existing body of knowledge and literature corpus, highlighting the similar points, contributions, and both practical and research implications.

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In this section, we tried to contrast the findings of our study with the existing corpus of knowledge, and shed light to the similarities, contributions, and practical and research implications.

Our study confirms that the technological limitations are of the major barriers to the adoption of AI by internal auditors. Incompatible technological infrastructures, the perceived complexity, and auditors' lack of technological skills and expertise are three concerns that particularly come out.

Our study is in line with the studies of Torroba, et al. [13] and Li, et al. [6] who point to low user skill levels and technological complexity as persistent barriers. In addition, Zhu and Kraemer [7] emphasize the significance of technological maturity in facilitating the acceptance of new ideas and innovations, are also echoed by the lack of compatible infrastructure. In Morocco, public information systems are generally disjointed, making it challenging to incorporate cutting-edge technology solutions.

Moreover, the perception of AI systems as a "black box", as Seethamraju and Hecimovic [12] demonstrated, can lead to a lack of trust and hinder their use, especially in a field where openness is crucial.

The high investment cost related to AI expenditures and the basic objectives of public sector organizations oriented towards public service are the two main issues that come to light from an organizational viewpoint. Agreed unanimously, the high cost is a barrier. This insight is supported by the study carried out by Yang, et al. [3] which emphasizes the critical role that financial resources play in technology adoption. In addition, the related body of literature stresses the importance of management support as a strategic driver of business success [6]. Nevertheless, this support often appears to be insufficient or dependent on the achievement of measurable results.

Furthermore, due to the internal audit's strong reliance on professional judgment and preponderance of qualitative data, it is commonly noted as having a poor compatibility with AI technologies. This insight is consistent with the findings of the study conducted by Leo, et al. [14] which found that the intention to use technology is mostly determined by how relevant the technology is considered to the activities in question.

From the environmental level, according to the study's findings, one of the main barriers to the adoption of AI in the public sector is the lack appropriate regulations and laws. Auditors are cautious about new technologies or even block them because there is no defined legal framework, which leads to a lack of security. This viewpoint is supported by studies, such as Torroba, et al. [13] which emphasize the importance of legislative supervision as a precondition for any adoption efforts to integrate technology in public organisations. The absence of technical support, namely the absence of human resources with perquisite artificial intelligence training, capable of assisting with the path of transformation, is another difficulty. This viewpoint is consistent with the findings of Junior, et al. [9] who contend that adoption capacities are directly impacted by the availability of technology partners and suppliers.

Contrasting the empirical findings with the TOE framework and the literature brings to light both timeless and context-specific obstacles to AI adoption in internal auditing. While certain of the challenges, e.g., technological sophistication or skills shortage, are generic across most settings, others appear particular to the Moroccan public sector, e.g., the legal void or the purported incongruence between social missions and technological instruments.

Therefore, by offering a contextualized understanding of the barriers to technological innovation and demonstrating the applicability of the TOE framework for analysing adoption dynamics in intricate institutional systems, this study adds to the body of existing research. It also underlines the importance of a systemic and multi-level approach to understanding the reluctance to use AI in functions as sensitive as internal audit.

7. Conclusion, Limitations and Research Perspectives

The rise of artificial intelligence in the field of internal audit represents a major opportunity to strengthen the performance, effectiveness and efficiency of audit processes. However, as this exploratory

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study conducted among internal auditors in the Moroccan public sector reveals, the integration of AI faces a set of multidimensional obstacles that limit its effective implementation.

By using the Technology-Organization-Environment framework, this research has made it possible to structure the analysis of barriers along three axes. From a technological perspective, the main obstacles relate to the complexity of AI tools, the inadequacy of existing infrastructures, and the lack of technical skills. These findings, consistent with the literature, highlight the specificities related to the level of digital maturity of the Moroccan public sector.

At the organizational level, the high cost of necessary investments, combined with the non-profit and social nature of public missions, limits the perceived relevance of AI. This observation highlights the importance of an adoption approach aligned with the internal realities of the audited structures.

The environmental context, meanwhile, acts as a significant obstacle. The absence of a legal framework governing the use of AI and the lack of technical support contribute to a form of institutional inaction. This situation calls for strong public support, built around clear policies, adapted regulations, and technological partnerships.

Our study thus offers a twofold contribution. From a theoretical perspective, it enriches the literature by proposing an empirical and contextualized reading of the barriers to AI adoption in a little-studied field: internal audit in the public sector in an emerging context. It also confirms the relevance of the TOE framework for analysing technological adoption dynamics. From a practical perspective, the results highlight the need for concrete actions in terms of training, technological investment, regulatory framework, and mobilization of expertise.

Like any exploratory work, this study has certain limitations. The limited size of the target studied, although based on theoretical saturation, reduces the representativeness of the results. Furthermore, the exclusive use of a qualitative approach, although appropriate for exploring perceptions, does not allow for generalization to the entire sector.

Despite this, this research opens several perspectives. A larger-scale quantitative study would allow for the validation of the results and the measurement of their statistical significance. Comparisons between institutional contexts or countries could enrich the analysis. Finally, the involvement of other actors, such as information systems departments, technology experts, or public decision-makers, would offer a more comprehensive understanding of the conditions for AI adoption in internal audit, particularly in relation to the evolution of skills and professional practices.

Transparency:

The authors confirm that the manuscript is an honest, accurate, and transparent account of the study; that no vital features of the study have been omitted; and that any discrepancies from the study as planned have been explained. This study followed all ethical practices during writing.

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