

Digitalization and Internal Audit Effectiveness: The Case of Large Moroccan Companies in the Casablanca-Settat Region

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Abstract— In today's rapidly evolving digital economy, internal audit functions are no longer confined to traditional desk reviews and manual procedures. They are being challenged to harness digital technologies to deliver faster, deeper, and more reliable assurance. Despite the widespread adoption of digital tools across industries, their actual influence on the effectiveness of internal auditing — especially in emerging economies — remains insufficiently explored. This study investigates how digitalization shapes internal audit effectiveness within large Moroccan companies in the Casablanca-Settat region. Building on contemporary frameworks of digital audit transformation and audit performance, we develop a set of hypotheses that posit a positive relationship between digital technologies and key dimensions of audit effectiveness, including efficiency, risk detection, and report quality. These hypotheses are empirically tested through a quantitative survey administered to internal audit professionals in 10 major firms. The results provide novel insights into how digital maturity influences audit outcomes in contexts where digital transformation is accelerating but research evidence is scarce. The findings offer value for audit practitioners, corporate leaders, and policymakers seeking to strengthen risk governance in an increasingly digital business environment.

Keywords— Digitalization, Internal Audit, Survey, Hypothesis, Moroccan companies.

I. INTRODUCTION

Digital transformation has reshaped corporate operations worldwide, altering organizational structures, control mechanisms, and governance processes. Internal audit—traditionally grounded in manual testing and retrospective analyses—now faces pressure to modernize using digital tools such as automated analytics, continuous auditing, and artificial intelligence. These tools promise significant efficiency gains, yet their real performance impact in emerging contexts such as Morocco remains under-researched.

In Morocco's Casablanca-Settat region, which hosts the headquarters of major industrial, financial, and public enterprises, digitization has become a strategic priority. However, internal audit functions often lag behind operational and financial departments in adopting data analytics, automation, and audit management software. Insufficient evidence exists regarding whether such tools effectively enhance audit performance dimensions such as reporting timeliness, risk identification, control assurance, and audit quality.

Thus, the core research problem of this study is to assess to what extent digitalization improves the effectiveness of internal audit functions within large Moroccan organizations. Specifically, does digital transformation produce measurable improvements across key performance dimensions—speed, competency, risk detection, analytic capability, and internal control efficiency?

The study aims to fill this gap by testing empirically the effects of organizational digitalization on internal audit outcomes through a survey administered to professional auditors, providing evidence from an African emerging market perspective.

II. LITERATURE REVIEW

1. DIGITALIZATION AND INTERNAL AUDIT TRANSFORMATION

over recent years, advances in information and communication technologies have fundamentally altered how internal audit functions operate. according to many researchers, digitalization creates both opportunities and risks, requiring auditors to develop agility and data-driven competence to ensure effective governance in increasingly complex environments. the integration of tools such as data analytics, robotic process automation (rpa), and artificial intelligence (ai) enables auditors to analyze full populations rather than samples, thus enhancing assurance quality and risk coverage.

Helmi and seyid (2025) in management control, auditing and finance review emphasize that ai introduces “augmented auditing,” enhancing fraud detection, compliance monitoring, and continuous risk assessment while demanding strong data governance and ethical oversight. likewise, ait lemqeddem and chouay (2020) found that digitalization within moroccan public entities prompted a paradigm shift in audit efficiency and reporting practices, although implementation challenges persisted.

Outaleb and lemalem (2023) show that digital transformation significantly improves internal control effectiveness among moroccan firms when aligned with process automation and transparency initiatives. similarly, el haji et al. (2024) demonstrated that digitalization strengthens management control practices in moroccan private enterprises by increasing transparency, decision-making speed, and resource allocation efficiency.

2. THEORETICAL FRAMEWORK

This research draws on three complementary theories:

Resource-Based View (RBV) — Digital capabilities constitute strategic assets that can enhance audit performance by improving efficiency, accuracy, and innovation capacity.

Technology Acceptance Model (TAM) — Auditors’ acceptance and usage of digital systems depend on perceived usefulness and ease of use, critically affecting digital performance outcomes.

Institutional Theory — Organizations adopt digital auditing practices under coercive and normative pressures (regulations, international audit standards, or stakeholder expectations), influencing their digital maturity.

3. EMPIRICAL GAPS AND RESEARCH IMPORTANCE

Despite increasing literature globally, empirical studies in Morocco remain scarce. Most existing research focuses on operational or financial areas, overlooking assurance and internal audit functions. Moreover, few studies test statistical relationships between digitalization level and multiple audit performance indicators. Consequently, this paper makes an original contribution by empirically linking digital transformation to measurable audit effectiveness components within Morocco’s corporate context.

III. METHODOLOGY

This study adopts a quantitative approach based on a structured survey distributed to internal auditors and audit managers in 10 large Moroccan companies operating in banking, manufacturing, telecommunications, and insurance. A total of 78 valid responses were collected between September and November 2025.

The questionnaire comprised closed items measured on a five-point Likert scale, evaluating perceptions of digitalization and audit performance. The instrument was validated for reliability using Cronbach’s Alpha, and data were analyzed using SPSS software

Therefore, the Dependent variable: Internal Audit Effectiveness, composed of five operational dimensions:

- Rapidity of Reporting

- Auditors' Competence
- Risk Detection Capability
- Quality of Analytical Tools
- Internal Control Efficiency

Independent variable: Level of Digitalization, reflecting the extent of adoption of technologies such as data analytics, audit management software, and automation.

Based on the theoretical framework and prior studies, the following hypotheses were formulated:

H1: Digitalization improves the rapidity of reporting.

H2: Digitalization positively enhances auditors' competencies.

H3: Digitalization contributes to improved risk detection.

H4: Digitalization improves the quality of analytical tools used in audits.

H5: Digitalization strengthens the efficiency of internal control.

➤ Statistical Tests

Normality was verified using Kolmogorov–Smirnov and Shapiro–Wilk tests. Where assumptions were not met, non-parametric tests (Mann-Whitney U) were applied. Hypotheses were validated based on beta coefficients (β), significance levels (p-values), and effect sizes (Cohen's d).

IV. EMPIRICAL RESULTS

Table 1. Hypothesis validation

Hypothesis	Statistical test	Result	Decision
1- Digitalization → Reporting Speed	Normality Test (Kolmogorov-Smirnov, Shapiro-Wilk) + Mann-Whitney U	$\beta = 0,74$; p = 0,000 p < 0,001	Validated
2- Digitalization → Auditor Competence	Levene Test (sig.) + Test T de Student + d de Cohen	d de Cohen = 0,703	Validated
3- Digitalization → Risk Detection	Normality Test (Kolmogorov-Smirnov, Shapiro-Wilk) + Mann-Whitney U	$\beta = 0,71$; p = 0,062 (P > 0,05)	Not Validated
4- Digitalization → Analytical Tools Quality .	Normality Test (Kolmogorov-Smirnov, Shapiro-Wilk) + Mann-Whitney U	$\beta = 0,18$; p = 0,002	Validated
5- Digitalization → Internal Control	Normality Test (Kolmogorov-Smirnov, Shapiro-Wilk) + Mann-Whitney U	$\beta = 0,66$; p = 0,003	Validated

Source : Authors

The analysis shows that digitalization has a statistically significant positive impact on three major dimensions of audit effectiveness: reporting speed (H1), auditor competence (H2), and internal control efficiency (H5). However, its impact on risk detection (H3) and analytical tool quality (H4) was not statistically supported.

The validation of H1 confirms that digital platforms accelerate reporting by automating audit documentation and data consolidation, reducing manual tasks. The significance of H2 suggests that auditors leveraging digital tools acquire advanced analytical and technical skills, reinforcing professional competence. H5's validation highlights how technology integration strengthens internal control systems through improved monitoring and traceability.

Conversely, non-validation of H3 implies that risk detection still relies heavily on human judgment and contextual expertise rather than technology alone. Similarly, H4's non-significance may reflect early-stage adoption of analytical tools in Moroccan firms, where data infrastructure and standardization are still developing.

V. DISCUSSION

1. THE ROLE OF DIGITALIZATION IN AUDIT EFFICIENCY

The results align with international findings showing that digitalization significantly improves audit timeliness and quality. As Karimallah and Drissi (2024) underscore, digitized environments require internal audit functions to be agile and proactive. Moroccan auditors appear to leverage digital tools effectively to deliver quicker and more reliable audit outputs.

2. COMPETENCE ENHANCEMENT AND THE “AUGMENTED AUDITOR”

Validation of H2 confirms the transformative role of digitalization in upskilling auditors. Consistent with the “augmented auditing” model proposed by Helmi & Seyid (2025), Moroccan auditors are increasingly integrating data analytics, continuous audit, and visualization dashboards (e.g., Power BI, ACL, IDEA) into their daily activities. This redefines their role toward strategic advising and assurance on digital risks.

3. PERSISTENT LIMITATIONS IN RISK AND ANALYTICS TOOLS

The non-validation of H3 reflects structural limitations common in developing economies—namely, fragmented information systems, lack of historical datasets, and resistance to change. Risk analytics effectiveness requires not only digital tools but also mature data governance, integrated ERPs, and cross-functional collaboration—all still nascent in Morocco.

4. DIGITAL MATURITY AND INTERNAL CONTROL STRENGTH

Positive confirmation of H5 indicates that digital transformation reinforces internal control efficiency, echoing Outaleb & Lemalem (2023). Automated controls, electronic workflows, and traceable data trails enhance process reliability and accountability while reducing manual error.

VI. CONCLUSION AND IMPLICATIONS

This study empirically demonstrates that digitalization significantly enhances key dimensions of internal audit effectiveness in Moroccan firms, particularly reporting timeliness, auditor capability, and internal control performance. However, its potential to revolutionize risk detection and analytical sophistication remains under-realized, constrained by limited data availability and infrastructural challenges. For Audit Departments, the research invests in data analytics training and integrated audit management systems to deepen analytic capacity. Also, for Organizational Leaders, our study aligns digitalization initiatives with internal assurance frameworks and governance objectives. And then, for Policymakers, the adoption of this topic encourages national standards for digital assurance practices and capacity-building programs.

Moreover, this research extends existing frameworks of digital transformation to the internal audit field in an emerging economy, validating parts of the Technology Acceptance and Resource-Based View theories.

The study's sample is geographically limited to the Casablanca-Settat region and based on perceptual data. Future research could incorporate longitudinal designs, cross-sectoral comparisons, or mixed-method approaches combining interviews and content analysis to better capture qualitative insights into digital audit maturity.

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