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Innovation in Performance Audits: Tools, Techniques, and Transformation

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EDITORIAL



Christina Gellerbrant Hagberg, Auditor General, Swedish National Audit Office. Source: Swedish National Audit Office (Riksrevisionen)

From Mystery to Practice: How the Swedish National Audit Office Approaches AI in Its Performance Auditing

Author: Christina Gellerbrant Hagberg, Auditor General, Swedish National Audit Office (Riksrevisionen)

Introduction: Demystifying AI

Across Supreme Audit Institutions, conversations about artificial intelligence (AI) often focus on technology. Discussions highlight models, data infrastructure, governance frameworks and future potential. Talk about AI is often shrouded in a certain air of mystery; practical applications tend to be conflated with more visionary ideas such as autonomous agents or even quantum computing. For many auditors, this can make AI seem complex – sometimes even intimidating.

Last year at the Swedish National Audit Office (Swedish NAO), we deliberately took a different starting point. Rather than engaging with AI at an abstract level, our ambition was to demystify it – by bringing the focus back to how it can be used in auditing.

After six months of operational use of Microsoft Copilot throughout the organisation – both on a broad and more extensive scale in performance audit – we have begun to form a clearer view. Our experience indicates that the real transformation is not primarily technological, but is rather a matter of employees' mindset.

A Strategic Choice: Practice Before Theory

Early in our adoption of Copilot, the Swedish NAO made a clear organisational choice. We did not position AI as a large-scale transformation programme or a technical development project. Instead, we chose a direction based on three simple principles:

- Use existing, secure tools – primarily Copilot.
- Emphasise practical rather than theoretical learning.
- Encourage experimentation in daily work.

This approach embodies a basic insight about professional development: auditors do not learn professional judgement by reading policies – they learn it through practice.

No Need to Understand the Underlying Code

There is a useful distinction to be made between auditing AI models as such, and examining how organisations apply AI to improve their operations.

In some rare cases, the AI model itself may be the object of audit – for example, when a public authority relies on an algorithm in its decision-making. In such cases, a certain level of technical understanding may be needed to assess how the model functions and the risks it poses. However, this type of audit is relatively uncommon in performance auditing.

More often, the focus is on how organisations use AI as part of broader efforts to improve efficiency and effectiveness. Here, AI is not radically different from other forms of digitalisation. Relevant audit questions concern governance, risk management, internal controls, learning and follow-up: do organisations test and validate their use of AI, assess risks, manage unintended consequences, and ensure that the technology contributes to intended outcomes?

Auditing AI does not require entirely new audit tools – it necessitates the application of established audit approaches to a new type of instrument. As in other areas of digitalisation, the focus is on how the organisation operates, rather than on the internal workings of the technology itself.

The key implication is that most auditors do not need to have a deep technical understanding of AI. What they need is the ability to assess how organisations govern and how they use AI in practice, using the same core principles that underpin performance audit more generally.

AI – a Matter of Leadership

One of our most important lessons has been that AI adoption is less about technology and more about leadership. At the Swedish NAO, this means that leadership has focused on creating conditions for learning, lowering barriers to experimentation, clarifying expectations and responsibilities, and reducing unnecessary fear and uncertainty.

Encouraging experimentation does not mean removing control. Our approach has relied on a combination of freedom and clear boundaries. Auditors are encouraged to experiment in their daily work, while human judgement remains fully in control of all conclusions. AI tools must not be used to process sensitive or classified data.

This approach of 'responsible freedom' has proven essential. It enables learning while maintaining trust, accountability and compliance.

What AI Actually Supports

In practical terms, AI has proved to be most useful as a support tool. Our performance auditors use AI to:

- structure and refine ideas;
- analyse large volumes of text;
- summarise documents and interviews;
- improve clarity and language in reports;
- challenge initial assumptions.

This often leads to a secondary effect involving higher expectations in terms of clarity and reasoning. When arguments can be tested more rapidly and alternative explanations are easier to generate, it raises the analytical standard. Our next step will be to explore how AI can support financial audit.

Quality, Risk and Responsibility

A common question is how the question of responsibility is affected by AI. At the Swedish NAO, we have taken the clear position that AI does not lead to a change in the fundamental principles of audit responsibility.

The auditor remains fully accountable for all conclusions. AI outputs are simply treated as suggestions by a very helpful 'intern' or 'co-pilot'. AI output must always be critically reviewed and validated.

While risks such as error or bias are real, they should be managed in the same way as any other risks – with professional skepticism and through review.

One of the most significant practical challenges relates to data. Many datasets used in auditing are confidential or classified, while many advanced AI tools operate in cloud environments. This leads to limitations in terms of use. Our approach has been pragmatic; rather than waiting for perfect solutions, we focus on what is feasible within current limitations.

Six Months In: Early Observations

After six months of operational use, several patterns are emerging. Auditors increasingly find their own relevant use cases. AI is most useful in everyday tasks rather than in isolated pilot projects. Learning spreads through practice and dialogue rather than through formal training. The perceived mystery of AI is dispelled once auditors start using it.

The main lesson at the Swedish NAO is simple: do not begin with a technical approach – begin, instead, with a practical approach. To be useful, the technical underpinning of AI does not need to be fully understood. What matters is how it is integrated into everyday tasks, whether learning is supported, and that audit responsibility is maintained.

AI does not replace professional judgement. It reshapes how that judgement is developed and applied, which is, first and foremost, a matter of leadership.

EDITORIAL



Mrs. Amal Faraj, President of the State Audit and Administrative Control Bureau (SAACB), the Palestinian SAI. Source: SAACB

From Compliance to Performance Evaluation—the State Audit and Administrative Control Bureau's Performance Audit Transition

Author: Mrs. Amal Faraj, President of the State Audit and Administrative Control Bureau (SAACB), the Palestinian SAI

In a world of rapid changes and increasing challenges, governments are asked more than ever to have concrete findings, provide high quality public service and manage the available resources efficiently, effectively and responsibly. With these changes, the public audit is not only viewed as just ensuring compliance with laws and protocols but also evaluating the performance and measuring the actual influence of government policies and programs on lives of citizens.

Performance audit is a qualitative leap in the modern audit thinking, as a strategic tool that helps answer the significant questions on whether the goals are achieved, efficient use of resources, effective government interventions to address the development, economic and social challenges.

The State Audit & Administrative Control Bureau is the supreme audit institution of Palestine, responsible for public sector audit by producing audit reports that intend to increase good governance, improve institutional performance, ensure the best use of public funds and increase transparency, accountability and integrity.

The Bureau realized early on the importance of this global shift in audit practices, so it embraced an ambitious vision to develop its role from an institution that audits compliance to one that helps improve performance, bring an impact and cementing the public value. This shift was not just developing action tools or an expansion of mandate, but an integrated institutional project based on building capacity, developing methodology, supporting professional partnerships and establishing a culture based on continuous learning and innovation.

Over the past years, the Bureau has taken advanced steps to institutionalize and develop performance audit according to international audit standards, making use of pioneering international experience, and following the best professional practices that focus on findings, impact and value added.

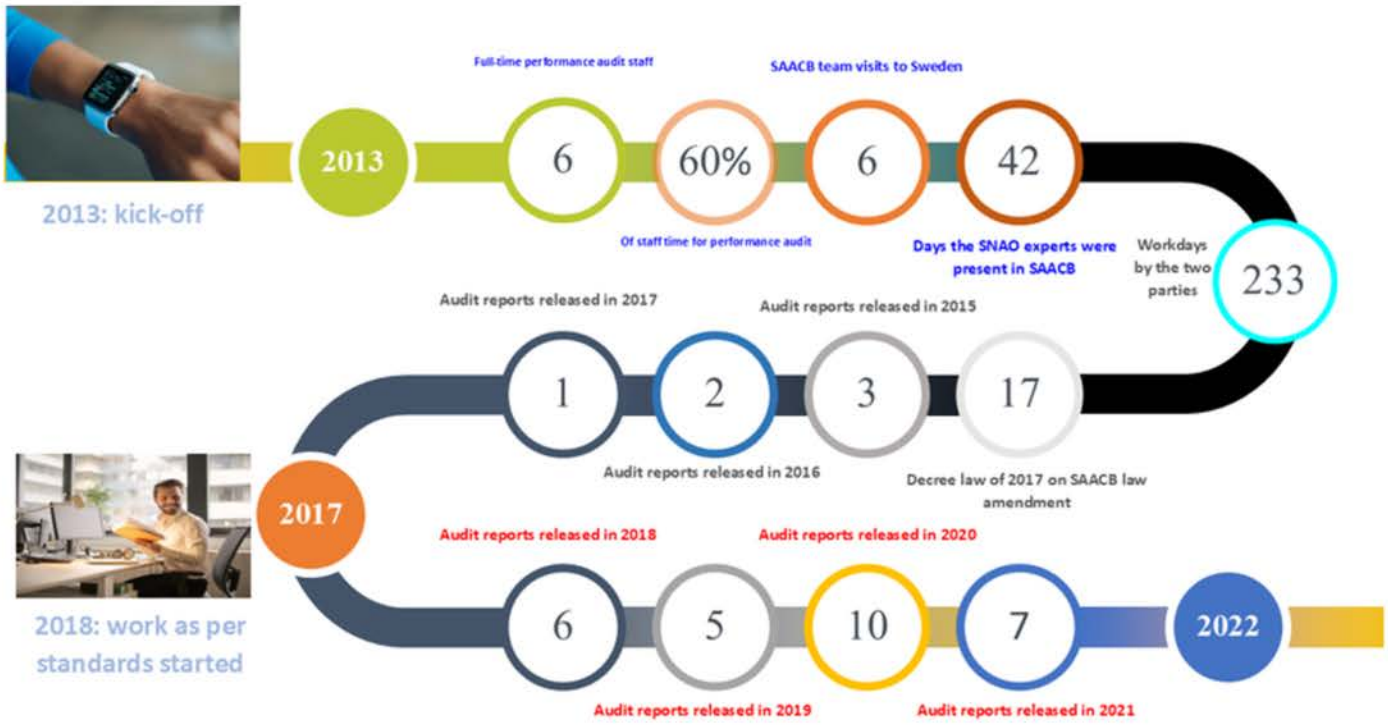
Challenges to Performance Audits

The Bureau encountered two major challenges against implementing effective performance audit. First, the Bureau had limited resources and staff had limited competencies in performance audit. Second, there was no clear legal mandate that authorizes the Bureau to practice this form of audit.

Although performance audits are important to improve public service and increase the government spending efficiency, the absence of necessary institutional and legislative components was an obstacle to developing a performance audit function.

Looking For a Solution through Strategic Peer to Peer Partnership

The Bureau has been keen to develop audit tools, so a strategic method based on having a partnership with a peer SAI with established experience in performance audit was adopted. This led to the partnership with the Swedish National Audit Office, which helped convey the knowledge and experience and build the institutional professional capacity of the Bureau.



Source: State Audit and Administrative Control Bureau (SAACB)

The peer SAI cooperation focused on developing and practicing performance audit methods and aligning the actions of the Bureau per international standards, and training and providing the auditors with necessary technical experience for performance audit reporting. Additionally, the Bureau established a specialized institutional core to develop the performance audit function.

The cooperation's first phase paid attention to building the professional basis of performance audit by developing and producing actual performance audits, publishing high quality reports with concrete influence and evidence, and; enhancing communication with stakeholders to ensure useful report findings.

As a result of the capacity building efforts and alignment to INTOSAI standards, this phase produced six performance audit reports, which served as the actual launching pad for this trajectory. In regards to the legal basis challenge, SAACB law of 2017 has also been amended so performance audit is one of the audit forms the Bureau undertakes, alongside financial and compliance audits.

Performance Audit Institutionalized and Developed

After setting the legal and professional basis, the Bureau moved towards a more advanced phase that focused on performance audit institutionalizing and sustainability, by:

- Establishing a special performance audit department as part of the Bureau's organizational structure.
- Including performance audit as part of the strategic plan (2017-2021).
- Preparing a professional performance audit guide and reference worksheets.
- Providing training programs for both auditors and managers to raise awareness and expand their professional methodology.
- Developing protocols for quality assurance, report reviewing and audit plans.
- Enhancing communication with audited entities and stakeholders to explain and make use of report findings.
- Exchanging the experience with peer SAIs in sustainable development goals (SDGs) performance audit as part of the 'Sharaka' program with the Dutch SAI.

Findings and Achievements

By the end of 2025, the Bureau released more than 70 performance audit reports that included different vital sectors in Palestine. These reports are now an important reference for the government, decision makers, audited entities and the public.

These performance audit reports also helped the Bureau develop measurement protocols for findings and influence in the public sector and support decision-making by providing practical and enforceable recommendations. By publishing performance audit reports publicly and on social media platforms, the Bureau enhances the transparency of public policies implemented. The Bureau has established itself as an audit institution that pays attention to findings and value added,

Findings of the experience for the Bureau were not just about developing the audits, but also directly helping improve the public service. The recommendations that stemmed from the performance audits contributed to real positive impact to public programs, including but not limited to:

- Reduced waiting time at emergency rooms in hospitals.
- The development of a unified system to monitor and manage medical equipment.
- Regulation of x-ray imaging wards in government hospitals.
- Application of preventive maintenance for water networks to reduce losses.
- Increases of inspection rounds of goods in markets.
- Appointment and empowerment of the disabled in public service.

The cabinet is using a number of performance audit recommendations upon releasing government decisions and policies.

The experience of the Bureau shows that the shift towards performance audit is not just a development of audit tools, but a strategic transition in the audit thinking that intends to move from focus on compliance to measurement of findings and actual impact of government policies and programs.

Thanks to this shift, the Bureau is now more able to contribute into improving the government performance and governance system, and enhancing the public service quality, in order to have its vision to make a concrete difference in lives of Palestinian citizens.

Looking Forward

We are today on the verge of a new phase of institutional development. The rapid digital changes and the increasingly complex environments of government work mean that innovation is the main foundation for the performance audit future. Supreme audit institutions do not only evaluate the past events, but are also required to disclose and evaluate risks, make use of future opportunities and employ modern technology for data analysis and directions that support decision makers. The Bureau, driven by this view, is enhancing the use advanced digital tools, benefiting from data analytics and artificial intelligence, developing more resilient and proactive audit means and having more effective communication channels with audited entities by setting internal control units therein in force, which helps raise the audits efficiency, improve output quality and strengthen the audit recommendations impact.

Our vision for the future is having more intelligent, proactive and influential audits, which can explore risks, analyze directions, evaluate findings comprehensively, and provide visions and recommendations that support decision making, enhance the public administration efficiency and bring sustainable development.

The citizen will be the pivot of our attention and effort. The real value is not measured by the number of reports or observations, but with the positive influence brought into the public service quality, institutional efficiency and level of trust between citizens and state foundations.

The performance audit journey of the Bureau represents an institutional transition story and professional willingness, which believe that the modern audit is a development and reform partner, and that innovation is not an interim choice but a long-lasting method to keep pace with the future and make positive change.

As the Bureau is keeping the innovation and development quest, it renews the compliance with adopting the best international practices and standards, enhancing its part as national audit institution that protects the public funds, establishing the sustainable development and bringing the best possible value for the Palestinian citizens.

FEATURE ARTICLE

Innovative Methodologies in Evaluation and Public Audit



Figure 1: A protected area in baa atoll. Source: Auditor General's Office of the Maldives

Beyond the Surface: Using Community Insights, Spatial Data, and Underwater Verification to Strengthen Environmental Audits

Lead Author: Aminath Nausha, Co Authors: Hussain Niyazy, Ibrahim Aiman, Mohamed Ibrahim Jaleel, Aminath Muaza. Auditor General's Office of the Maldives

Introduction

Environmental audits, especially in marine protected areas, face challenges in obtaining reliable evidence as environmental conditions often evolve gradually and are not completely reflected in routine monitoring records. Such challenges may necessitate an approach beyond conventional audit methods.

During the environmental audit of governance and coordination mechanisms in the Protected areas of the Baa Atoll Biosphere Reserve, the audit team encountered issues that could not be fully resolved through document review alone. Addressing these questions required innovative approaches that ultimately strengthened the audit findings. This enabled our team to independently validate stakeholder observations, strengthen the audit evidence base, and identify issues that may otherwise have remained undetected.

This article shares our experience of integrating these techniques into an environmental audit and how we embed other verification methods with limited resources, in complex and dynamic settings.

Audit Objective and Scope

The audit aimed to assess the effectiveness of governance and coordination mechanisms for managing protected areas within the Baa atoll biosphere reserve for the duration of 2015–2024, examining both terrestrial and marine protected zones.

To build an understanding of the system, the audit team initially reviewed relevant documentation, including policies, monitoring reports, and regulatory frameworks, and conducted interviews with key institutional stakeholders.

In an initiative to enhance community involvement in the audit process, the audit team conducted focus group discussions with key stakeholders across the atoll, including divers, farmers, fishermen, guesthouse operators, resort representatives, and local councils. In parallel, perception surveys were administered to capture broader public views on the audit subject. These discussions provided valuable insights and highlighted noticeable changes within the protected areas of the Atoll. One of the significant changes notified was the disappearance of B. Bathalaa island which was a part of a Protected Area designated on 05 June 2011. This was a pivotal moment in the audit, where stakeholder knowledge became a trigger for further investigation.



Figure 2: From stakeholder consultations. Source: Auditor General's Office of the Maldives

Building a Complete Picture

While stakeholder interviews and documentary reviews are essential, they also revealed gaps. Across institutions, information was fragmented, and some records were inconsistent or incomplete. Several stakeholders reported environmental changes over time, however, limited evidence existed to document their extent or the response of the monitoring agencies.

With these limitations, the audit team sought to expand the evidence base beyond document verifications in order to see the bigger picture. This involved identifying alternative methods that could provide independent, objective, and time-referenced information to complement stakeholder observations, leading to the incorporation of geospatial analysis from satellite imagery, followed by field verification.

An Aerial Perspective

Satellite imagery formed a key basis for preliminary analysis. Time series analysis was conducted for Protected areas using ESRI Wayback World Imagery and Google earth from the 1990s onwards to assess changes in coastal features and land areas during this period. One notable observation aligned with stakeholder information: a small island known as B. Bathalaa was no longer existent in more recent images.

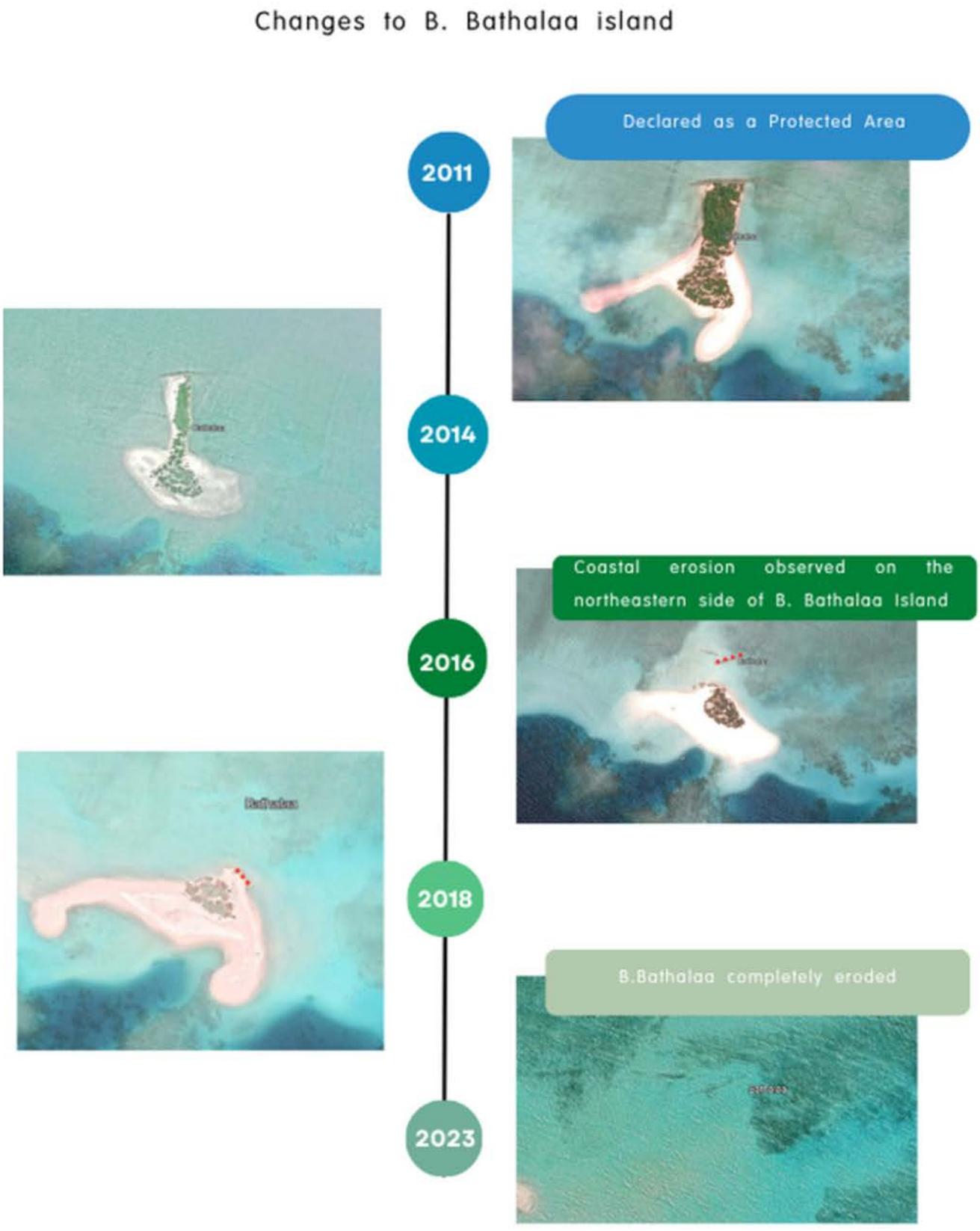


Figure 3: Changes observed to Bathalaa island. Source: Auditor General's Office of the Maldives

To assess whether this change could be attributed to natural island morpho-dynamics, the team extended the time series analysis to islands in the surrounding area. No comparable changes were observed in neighboring islands, suggesting that natural processes alone were unlikely to explain the disappearance. This pointed to the potential influence of anthropogenic activities. Further analysis of infrastructure development and physical modifications revealed evidence of coastal protection works carried out around the island. This analysis aided in further investigation, helping identify the location requiring physical inspections.

Validating Findings Through Underwater Observation

Spatial analysis indicated the possible presence of coastal protection works along the island's shoreline. To verify this observation, meetings were held with the authority responsible for monitoring the area. The Office confirmed the finding and provided evidence of an inspection conducted in response to a public report. During this inspection, the coastal protection works were observed in progress.



Figure 4: From the field investigations at Bathalaa region. Source: Auditor General's Office of the Maldives

However, as the island was under lease, the office did not pursue further action, instead issuing an informal notification to the relevant monitoring authority. While these consultations strengthened and corroborated the spatial analysis, the absence of photographic evidence necessitated further investigation.

The team conducted underwater visual inspections in selected areas identified through geospatial analysis. Locating the precise areas of coastal infrastructure proved challenging due to the absence of unmanned aerial vehicle (drone) support and strong lagoon currents, which required the team to snorkel for extended periods in the open lagoon.

Despite these challenges, evidence of submerged coastal protection measures was eventually identified. Remnants of structural works were observed beneath the water surface. Subsequent review indicated that no feasibility studies or Environmental Impact Assessments had been conducted, and no permits had been issued by the relevant authorities for the coastal modifications undertaken on the island.

Photographs, observations, and location data collected during the inspections were carefully documented. Direct observation of the area through snorkeling than relying solely on secondary information added value to the finding. The evidence gathered was cross-checked against other audit evidence. The combination of satellite imagery, documentary evidence, stakeholder interviews, and underwater observations provided a much clearer picture of what had occurred within the protected area.

Most importantly, it allowed the audit team to move beyond assumptions and establish findings supported by multiple independent sources of evidence.

Root Causes

Lack of Policy Coherence and Governance

Responsibilities for island administration, conservation, tourism development are dispersed among multiple government entities. The audit found that mandates, policy coherence and coordination mechanisms were not sufficiently effective to ensure that decisions were consistently aligned with protected area requirements. This was one of the key reasons which led to leasing the island and developmental activities being conducted on the island after it was declared as a Protected Area.

Non-Compliance with Relevant Regulations

Environmental assessments, concept approvals, and adequate studies were not obtained prior to undertaking coastal protection and island modification works. The absence of these regulatory safeguards limited the consideration of potential environmental impacts which would otherwise have been flagged. Subsequent assessments by the Environmental Regulatory Authority identified the unauthorized coastal protection works as a likely contributing factor to the island's erosion.



Figure 5: Auditors inspecting a protected area in baa atoll. Source: Auditor General's Office of the Maldives

Weaknesses in Documentation and Regulatory Oversight

Monitoring, documentation, and enforcement processes were not sufficiently robust to support timely regulatory action. As the entity responsible for managing the Protected Area of B Atoll, though inspections were carried out to address the public complaint received regarding works carried out in the island, formal report with proper evidence was not prepared. Timely actions for the complaint were not taken by the regulatory agency and with limited follow-up it reduced the effectiveness of oversight mechanisms and weakened accountability for activities undertaken in Bathala island.

Conclusion

The audit which began as an assessment of governance and coordination within a protected marine area, involved exploring new ways of gathering evidence and understanding environmental change.

By combining satellite imagery with underwater verification, the audit team identified undocumented changes, key observations were validated, and the overall quality of audit findings were strengthened. More broadly, the experience demonstrated how innovation can emerge from practical necessity and how adaptable audit approaches can support SAIs in maintaining its effectiveness.

FEATURE ARTICLE

Innovative Methodologies in Evaluation and Public Audit



Source: Adobe Stock Images, kentoh

U.S. GAO's Fraud Estimates: Key Steps Ensure Decision-Makers Fully Accept and Understand Innovative Approaches

Authors: Kathleen Donovan, Heather Dunahoo, Tonita Gillich, Lauren Kirkpatrick, Nicholas Weeks, U.S. Government Accountability Office

Over the past several years, the U.S. Government Accountability Office (GAO) estimated fraud facing the U.S. government using rigorous approaches that helped communicate the extent and impact of fraud in federal programs to Congress, the American public and antifraud professionals.

In 2024, GAO estimated annual government-wide fraud losses for the first time. These losses totaled between $233 billion and $521 billion annually, based on data from fiscal years 2018 through 2022.[1] This amount represents three to seven percent of annual federal spending during the same period. And, in 2023, GAO estimated that the total amount of fraud within U.S. unemployment insurance programs likely fell between $100 billion and $135 billion from April 2020 to May 2023—about 10 to 15 percent of unemployment insurance benefits distributed during this time.[2]

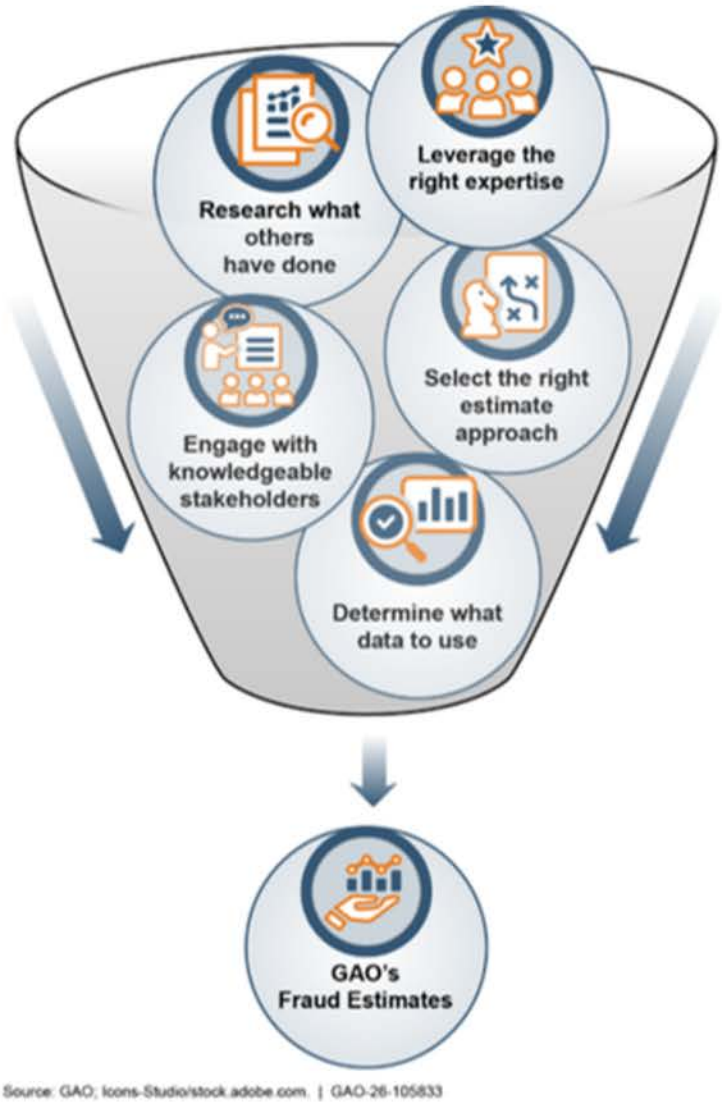
Both estimates, though different in scope, provide powerful insights into the extent of fraud losses and highlight the significance of fraud affecting federal programs and operations, including fraud committed during the COVID-19 pandemic.

Before GAO's fraud estimates, federal agencies, policymakers, and the public lacked a robust understanding of how much public money was lost to fraud. In response to a GAO survey, federal program managers acknowledged that understanding the extent of fraud loss is an important factor to consider when managing fraud risk.[3] However, some federal program managers did not believe fraud was a significant problem in their program. GAO's fraud estimates, especially the estimate of government-wide fraud, brought greater attention and clarity to the extent of fraud in government programs.

GAO took a few key steps to ensure that its fraud estimates would withstand the scrutiny of a potentially skeptical audience and that decision makers would understand and use the estimates. These steps included carefully developing the estimates, appropriately framing the results, and conducting extensive outreach to a wide variety of audiences.

Developing Fraud Estimates

GAO used the same fundamental building blocks for both estimates. The figure below provides an overview:



Source: GAO; Icons-Studio/stock.adobe.com. | GAO-26-105833

Source: GAO; Icons-Studio/stock.adobe.com. | GAO-26-105833

- Leverage the right expertise. GAO formed diverse teams to develop its fraud estimates. Teams included experts from across GAO with deep understanding of fraud, economists, methodologists, statisticians, and attorneys.

- Research what others have done. Before the analysis, teams conducted extensive research on other fraud estimation work to identify potential methods and considerations. This research also helped teams validate GAO's estimates later in the process.

- Engage with knowledgeable stakeholders. GAO met with law enforcement professionals, program officials, experts in academia, and other oversight professionals to discuss approaches, data, theory, and results.

- **Determine what data to use.** GAO spent several months identifying and understanding different data sources available to use in its statistical models for each estimate. Each data source had its own unique considerations that could create biases and limitations. After identifying potential data sources, the teams selected, analyzed, and organized the data for the final estimation process.

- **Select the right estimate approach.** GAO's two fraud estimates did not use the same approach and the right estimation approach depends heavily on the data available and the aims of the estimate. According to GAO's Chief Statistician, Jared Smith, "When fraud is associated with individual records, it may be possible to use a statistical sample of those records to estimate fraud to a broader population. GAO used this approach to estimate unemployment insurance fraud during the pandemic. When looking at fraud at a broader level, as GAO did with its government-wide fraud estimate, statistical modeling with Monte-Carlo simulation served as a more powerful tool." Monte-Carlo simulation, a method that can be used to estimate ranges for events where there is a high degree of uncertainty or for which there are limited data, used in the government-wide fraud estimate, was appropriate given the uncertainty associated with estimating fraud and the limited quality data available on government-wide fraud.

- **Verify and validate.** GAO's estimates underwent extensive verification and validation. GAO carefully assessed the reliability of the data used in the estimates including through interviews with knowledgeable agency officials. The models' assumptions and approaches were reviewed internally and in coordination with outside experts and also compared against fraud measurement and estimation studies. The results of the models were examined including through sensitivity testing. Each step in the process adhered to GAO's quality assurance framework, reflecting our rigorous standards for documentation and independent review.

GAO's Approach to Communicating its Fraud Estimates

GAO presented both its government-wide and unemployment insurance fraud estimates in public reports with appropriate context, including background information on federal program fraud and guidance on how to interpret the estimates.

The government-wide estimate report also included a detailed discussion on how estimates support program integrity. For example, fraud estimates can help demonstrate the scope of the problem, improve oversight prioritization, and demonstrate the return on investment to fraud risk management.

The unemployment insurance estimate report described the unique eligibility requirements and internal control weaknesses related to the temporary expansion of unemployment insurance programs during the COVID-19 pandemic.

By framing the fraud estimates in the larger context of fraud risk management, GAO provided critical information necessary to fully understand and use these estimates appropriately. For example, GAO explained the risk environments reflected in the government-wide estimate and how the estimate contrasted to estimates of improper payments.

Conducting outreach to a variety of audiences also helped communicate GAO's estimates and encourage its adoption in managing fraud risks, as the figure below illustrates.

According to Forensic Audits & Investigative Service Director, Rebecca Shea, "Outreach during the work helped particularly with getting agreement with our recommendations. No matter how agencies felt about the number, they agreed with the value of estimation for improving fraud prevention. As a result, they agreed to implement the recommendations we made to enhance fraud estimation efforts. In fact, the U.S. Department of the Treasury is already exploring options for developing more granular fraud estimates to drive prevention and detection efforts."



Source: GAO; Icons-Studio/stock.adobe.com. | GAO-26-105833

Fraud Estimation Supports the Oversight Mission

GAO's fraud estimates complemented GAO's oversight work. For example, the estimates complemented GAO's 2025 update to its long-standing High Risk List, which highlights areas across the federal government with serious vulnerabilities to fraud, waste, abuse, and mismanagement, or in need of transformation. GAO updates this list at the start of each new congressional session. The estimates also supported GAO's priority recommendations, which are recommendations that have not been implemented and warrant attention from heads of key departments or agencies because their implementation could save large amounts of money; improve congressional or executive branch decision-making on major issues; eliminate mismanagement, fraud, and abuse; or ensure that programs comply with laws and funds are legally spent, among other benefits. Each year, GAO sends letters to the heads of heads of key departments and agencies, urging them to focus on these priority recommendations.

Other SAIs could consider how such estimates could advance their respective oversight efforts. Fraud estimates could help legislative bodies, program managers, and taxpayers better understand the size and scope of fraud in public spending. The work can also help SAIs identify and address weaknesses with existing efforts to measure and combat fraud, while also helping governments determine the right level of antifraud investments. Such estimates serve as benchmarks for calculating the return on investments in prevention and detection activities. Furthermore, they are foundational to demonstrating the integrity within program administration. According to former U.S. Comptroller General Gene Dodaro, "in addition to helping people understand what is lost to fraud, fraud estimates can help prioritize oversight agendas by identifying government programs particularly at risk for significant fraud losses." He further noted that fraud estimates could also support recommendations related to preventing detecting fraud and responding to fraud. And in 2026, Acting U.S. Comptroller General Orice Williams-Brown highlighted GAO's fraud estimates as part of Congressional testimony on GAO's efforts to address fraud, waste, and abuse in federal programs—specifically noting both completed and future fraud estimates as critical to this effort.

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Source: Adobe Stock Images, Nuthawut

Enhancing Public Value Through Thematic Auditing: Institutional Learning from BPK's Experience

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Introduction

Supreme Audit Institutions (SAIs) play an essential role in strengthening accountability and transparency within democratic governance systems. As public policy challenges become increasingly complex and interconnected, SAIs are expected not only to provide assurance, but also to contribute more directly to governance improvement and sustainable development outcomes.

This expectation is reflected in INTOSAI-P 12, which emphasizes that SAIs should create value and deliver tangible benefits to citizens through stronger accountability, transparency, and public sector performance (INTOSAI, 2013). International discussions have also highlighted the growing need for SAIs to address cross-sectoral and long-term governance challenges, including sustainable development and governance resilience (INTOSAI Journal, 2021).

In Indonesia, this evolving environment encouraged the Audit Board of the Republic of Indonesia (BPK) to adopt a thematic audit approach. Traditional audits focusing on individual entities often produce fragmented findings that are insufficient to explain broader systemic problems involving multiple institutions and interconnected risks. Thematic auditing was therefore developed to provide more integrated perspectives by combining findings across ministries, regions, and levels of government.

Aligned with national development priorities and the Sustainable Development Goals (SDGs), thematic auditing has become an important strategic instrument within BPK's audit framework. This paper discusses BPK's experience in implementing thematic auditing and highlights institutional lessons related to systemic analysis, public value creation, and cross-sectoral governance.

From Entity-Based Audits to Systemic Analysis

The shift toward thematic auditing reflects a broader transformation in public sector auditing. While conventional audits provide valuable entity-level findings, they often struggle to capture governance challenges that span institutions, sectors, and levels of government. Thematic auditing adopts a whole-of-government perspective that enables auditors to assess policy coherence, institutional coordination, and cross-sectoral performance more comprehensively.

Within BPK, thematic audits are conducted outside the scope of financial audits and are guided by strategic themes established in audit policies and national priorities. Implemented through performance or compliance audits involving multiple audit units, their objective is to produce integrated conclusions while improving audit effectiveness and resources utilization (BPK, 2015).

Thematic auditing in Indonesia has evolved from sector-specific issues, such as economic resilience and infrastructure development, toward multidimensional challenges including environmental sustainability and climate resilience. This evolution reflects broader international trends toward governance-oriented and sustainability-focused auditing (Smith et al., 2021).

The initial implementation of thematic auditing presented several challenges. Limited auditor capacity and budget resources created risks of insufficient audit coverage for complex strategic programs involving multiple entities and sectors. In response, BPK strengthened audit design processes to ensure adequate coverage of key risks, stakeholders, and policy objectives. Coordination also proved challenging because thematic audits require collaboration among multiple audit units with different priorities and schedules. To address this issue, BPK established coordination mechanisms and strengthened leadership commitment to ensure methodological consistency and integrated conclusions.

Beyond these operational challenges, thematic auditing represents a shift from isolated organizational assessments toward systemic governance analysis. By integrating findings across institutions and sectors, thematic audits enable BPK to identify policy interdependencies, governance fragmentation, and implementation gaps that may not be visible through conventional audits.

Emerging Trends in Thematic Audits (2021–2025)

Between 2021 and 2025, thematic auditing in Indonesia expanded significantly in both scope and analytical orientation. Initially focused on post-pandemic economic recovery and human capital development, audit priorities gradually evolved toward infrastructure, governance transformation, regional equity, environmental sustainability, and climate-related risks.

By 2025, thematic audits were increasingly aligned with Indonesia's National Medium-Term Development Plan 2025-2029 (2025–2029), particularly in food security and human capital development. This evolution demonstrates a broader transition from sectoral and output-oriented auditing toward more forward-looking evaluations that emphasize long-term development outcomes and policy sustainability. The integration of SDGs into thematic audit planning further reinforces the growing role of SAIs in supporting sustainable governance.

Thematic Audits: Public Value and Institutional Challenges

One of the main strengths of thematic auditing lies in its capacity to generate public value. Through integrated and cross-sectoral assessment, thematic audits support organizational learning, policy improvement, and governance enhancement, contributing to better public services, accountability, and sustainable development outcomes.

This perspective aligns with Moore's concept of public value (1995), INTOSAI-P 12, and ISSAI 300, which emphasize that public sector auditing should generate meaningful societal benefits through improved accountability, efficiency, and effectiveness (INTOSAI, 2019). International discussions also increasingly highlight the need for SAIs to move beyond compliance-oriented functions toward greater policy relevance and public impact (OECD/SIGMA, 2024). Consistent with this perspective, thematic audit planning should reflect not only institutional priorities and risks, but also stakeholder concerns and societal expectations.

Although audit topic selection remains within BPK's mandate, thematic audit priorities are discussed through hearings with the House of Representatives (DPR), stakeholder focus group discussions, and stakeholder surveys. These mechanisms provide important inputs for identifying issues of public relevance and strategic importance.

Several institutional lessons have been identified from the implementation of thematic audits. Effective thematic auditing requires robust analytical planning and business case development, sustained coordination across audit units, improved sampling and audit coverage, and greater use of data analytics to support evidence-based conclusions. Another key lesson is the importance of identifying systemic and inter-institutional issues at the earliest stages of audit planning to strengthen policy relevance and audit coherence.

Despite these advantages, measuring audit impact remains challenging because the effects of audit recommendations are often indirect, gradual, and influenced by institutional and political factors. Nevertheless, previous studies suggest that audits contribute positively to accountability, financial disclosure, internal controls, and government performance (Imtinan & Hasibuan, 2021; Parwanto & Harto, 2017; Sayekti, 2015). Consequently, maximizing the public value of thematic auditing requires more comprehensive approaches to measuring both financial and non-financial impacts.

Future Directions: Integrating Cross-Sectoral Perspectives

Looking ahead, thematic auditing is expected to play an increasingly important role in addressing interconnected policy challenges. Priority areas such as energy, food, water security, and human capital development are increasingly understood as interdependent systems requiring coordinated policy responses. This reflects a gradual transition toward nexus-based auditing approaches in which policy interdependencies and systemic relationships are incorporated more explicitly into audit design and analysis.

Future improvements will likely focus on strengthening planning mechanisms capable of identifying system-wide issues from the outset, improving audit follow-up processes, expanding the use of data analytics, and enhancing coordination across audit units. Together, these developments will support the transition of thematic auditing from an emerging innovation into a more institutionalized and impact-oriented audit practice.

Implications for the Global SAI Community

BPK's experience provides several lessons for the global SAI community. First, thematic auditing offers an effective pathway for moving beyond fragmented entity-level assessments toward more systemic evaluations of governance performance. Second, integrating cross-sectoral perspectives early in the audit cycle improves the coherence and policy relevance of audit findings.

Third, stakeholder engagement mechanisms can enhance the relevance and legitimacy of thematic audits by ensuring that audit priorities reflect both governance risks and societal concerns. Fourth, stronger institutional coordination and clearly defined ownership are necessary to ensure that audit recommendations are translated into concrete policy improvements. Finally, the growing importance of data highlights the need for stronger analytical capabilities and institutional frameworks that support evidence-based and impact-oriented auditing.

Conclusion

BPK's experience demonstrates that thematic auditing can significantly strengthen the relevance and strategic impact of public sector auditing. By enabling auditors to identify systemic issues, strengthen cross-sectoral analysis, and connect audit findings to broader governance outcomes, thematic auditing provides a more integrated approach to addressing complex public sector challenges.

At the same time, BPK's implementation experience highlights several institutional lessons that require continuous strengthening, including more robust planning frameworks, stronger coordination mechanisms, enhanced analytical and data capabilities, and more comprehensive approaches to measuring audit impact.

As governance challenges become increasingly interconnected, thematic auditing offers SAIs an important opportunity to move beyond fragmented institutional assessments toward more integrated and policy-oriented evaluations. Through institutional learning, collaboration, and the incorporation of cross-sectoral perspectives, thematic auditing is becoming an increasingly strategic instrument for improving governance quality, supporting sustainable development, and generating public value in line with the evolving role of Supreme Audit Institutions.

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Costa Rica's Intermediate Cities. Source: Contraloría General de la República de Costa Rica

The Center-Periphery Divide: Performance Auditing and Systems Thinking in Costa Rica's Intermediate Cities

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Introduction

In recent years, intermediate cities have emerged as critical drivers of regional development, yet evaluating their public services poses unique challenges for Supreme Audit Institutions (SAIs). To address this gap, Costa Rica's SAI developed and implemented an innovative performance audit methodology specifically tailored to these distinct urban centers. This specialized framework advances traditional performance auditing by integrating a pragmatic assessment of public value, equity, and sustainable development within decentralized contexts.

Implemented in two sequential phases between 2024 and 2025, the methodology proved highly scalable. The initial 2024 audit evaluated the quality, timeliness, and future supply of six essential public services—potable water, electricity, solid waste collection, mobility, wastewater treatment, and telecommunications—across seven intermediate cities, covering operations from 2022 to 2023. This phase directly targeted reducing service gaps for vulnerable populations and aligning local governance with SDGs 6, 7, and 11.

Building on these insights, the 2025 audit expanded its scope both geographically (incorporating four additional cities) and sectorally, integrating education and healthcare into the evaluation for the 2023–2024 period. By focusing on practical, adaptable auditing tools, this two-phased approach not only drove measurable public value in Costa Rica but also established a replicable blueprint for other SAIs looking to audit decentralized public service delivery.

Methods

To evaluate the effectiveness and equity of public service coverage, the audits combined advanced data analytics, geospatial technology, and systemic analysis. This hybrid approach allowed the SAI to overcome a critical data limitation common to many public sector audits: the absence of recent national census data.

The first component of the methodology involved geospatial analysis and footprint definition. To delineate the boundaries of intermediate cities based on their visible urban footprints, the study applied convex hull geoprocessing to georeferenced data. These spatial data were then integrated using QGIS, linking public services to precise locations through Minimum Geostatistical Units (MGUs).

Building on this spatial foundation, the second phase incorporated advanced analytics and inequality metrics. To identify patterns without prior bias, an unsupervised machine learning technique—hierarchical cluster analysis—was executed in R, grouping spatial units based on shared public service efficiency characteristics. Additionally, the Gini Index was calculated to quantitatively measure internal inequalities in service provision.

Finally, systemic analysis and stakeholder validation were employed to ensure a holistic understanding of urban service gaps. The previous quantitative methods were complemented by systems thinking tools, including Causal Loop Diagrams and the Régnier Abacus. To conclude the process, the findings were refined and verified through collaborative validation sessions with key stakeholders.

Results

While Costa Rica's Territorial Economic Strategy 2020–2050 establishes a clear mandate for cohesive, equitable public service delivery to drive regional development, the application of this two-phased audit methodology across 11 intermediate cities revealed that actual execution falls short of this ideal. Instead, service delivery remains largely ineffective, replicating an unequal "center-periphery" model where institutions operate in silos and exacerbate local vulnerabilities.

The consolidated findings across all audited sectors demonstrate widespread disparities:

A. Environmental & Basic Utilities (Water, Sanitation, Waste, and Electricity)

- **Wastewater Treatment:** This emerged as the most critical infrastructure gap. In the first phase, treatment was completely absent in Ciudad Quesada, Guápiles, and Turrialba, and only partially provided in the other four cities. In the second phase, it was exclusively available in Nicoya, reaching a meager 14% of localized buildings.

- **Potable Water:** The fundamental right to water cannot be guaranteed. Ciudad Quesada, Liberia, and Limón failed to achieve a minimum of one connection per property in any sector, while Turrialba lacked sufficient information. In the second phase, significant connection gaps persisted in Nicoya and Quepos, while an absolute lack of georeferenced data completely prevented evaluation in Aguas Zarcas and Orotina.

- **Solid Waste Collection:** Both phases revealed incomplete coverage concentrated in peripheral areas. Deficiencies were prominent in the outskirts of Liberia, Limón, and Pérez Zeledón during the first phase, and remained unresolved in Aguas Zarcas and Nicoya during the second.

- **Electricity and Smart Grids:** While basic electricity is accessible, the modern transition to smart meters is highly unequal. Pérez Zeledón presented two clusters with critically low smart meter coverage, Puntarenas lacked minimum coverage entirely, and cities in the second phase showed incomplete deployment.



Wastewater treatment infrastructure in Nicoya. Source: Contraloría General de la República



Wastewater treatment infrastructure in Nicoya. Source: Contraloría General de la República



Solid Waste Collection Examples (clockwise from top left) in Orotina, Quepos, Nicoya, and Aguas Zarcas. Source: Contraloría General de la República



Electricity Infrastructure in Quepos. Source: Contraloría General de la República

B. Social Infrastructure & Mobility (Education, Healthcare, and Transport)

- **Urban Mobility and Congestion:** Severe traffic congestion plagued almost all intermediate city centers (such as Nicoya and Quepos), with rare exceptions found only in specific low-density clusters in Liberia and Puntarenas.

- **Education Access:** The 2025 expansion revealed that primary school students living over a kilometer away from educational centers faced distinct disadvantages due to the total absence of public student transport programs in Quepos, Aguas Zarcas, and Orotina.

- **Healthcare Delays:** In Quepos, structural planning flaws forced vulnerable populations to endure commutes exceeding four kilometers just to reach primary healthcare units, severely delaying access to essential medical services.



Urban Mobility and Congestion in (clockwise from top left) Nicoya (top left and top center), Aguas Zarcas, Orotina, and Quepos. Source: Contraloría General de la República



Schools in (clockwise from top left) Aguas Zarcas, Nicoya, Quepos (right top and bottom), Orotina (bottom center and left). Source: Contraloría General de la República



Healthcare in Quepos (top and bottom left), Nicoya (top right, bottom center), Orotina (bottom right). Source: Contraloría General de la República

C. Digital Infrastructure & The Data Governance Crisis

- **Telecommunications (4G vs. 5G)**: While 4G mobile internet is widely available in the second-phase cities, the first phase caught significant coverage blind spots in specific clusters of Ciudad Quesada, Guápiles, Liberia, Limón, and Pérez Zeledón. Looking forward, 5G deployment is severely bottlenecked; except for the Municipality of San Carlos, local governments lack harmonized regulations to deploy 5G infrastructure.

- **The $4 Million Information Gap**: A major systemic finding was the failure of data transparency. Despite a state investment exceeding $4 million to improve official information systems, operators failed to provide accurate georeferenced data. Furthermore, most institutions failed to update the National Territorial Information System (SNIT), creating data blind spots that actively hinder audit tracking and public decision-making.



Telecommunications Infrastructure in Aguas Zarcas (left), Orotina (center), and Nicoya (right). Source: Contraloría General de la República

Expected Effect and Institutional Impact

At the local level, these audits are structured to catalyze tangible improvements in public service delivery across intermediate cities. By pinpointing precise infrastructure and coverage gaps—particularly those affecting vulnerable populations—the findings provide actionable pathways toward more equitable municipal management.

To address these systemic failures, the SAI issued binding directives mandating that local governments and key utility operators co-create integrated planning mechanisms aligned with the 2020–2050 Strategy. Additionally, the mandates enforce standardized public service data publication within the National Territorial Information System (SNIT) and the immediate harmonization of municipal regulations to streamline telecommunications infrastructure deployment. Once implemented, these audit directives will directly help reduce territorial disparities, enhance the quality of life for urban residents, and promote inclusive environments aligned with the core principles of sustainable development and the right to the city.

Beyond local improvements, the strategic insights are designed to harmonize decentralized urban development with national macroeconomic objectives. By evaluating how current public services either support or hinder the National Territorial Economic Strategy, the audits establish a baseline for targeted, coordinated institutional interventions. This alignment ensures that future infrastructure optimization, utility provision, and technological advancements are leveraged effectively to boost regional connectivity and economic dynamism.

Crucially, these performance audits offer a transformative blueprint for other public auditing organizations by demonstrating how advanced technology and interdisciplinary methods can be integrated into traditional frameworks. The successful application of open-source software, such as QGIS for spatial data analysis and R for hierarchical clustering, proves that data-driven tools can drastically enhance the precision and depth of audit findings without requiring prohibitive financial investments. Furthermore, incorporating systems thinking tools introduces a dynamic approach to evaluating complex public sectors. Ultimately, by setting this methodological precedent, this framework provides other SAIs with a replicable model to modernize their practices, leading to more robust, insightful, and high-impact oversight worldwide.

Lessons Learned

- **Methodological Resilience in Data-Scarce Environments:** Major data gaps, such as the unavailability of official national census data, can be effectively mitigated by pivoting to alternative georeferenced data, urban footprints, and advanced spatial techniques.

- **Technical Upskilling and Digital Innovation:** Incorporating advanced programming languages (e.g., R Studio) and geospatial software (e.g., QGIS) allows traditional public sector assessment frameworks to transition toward robust data analytics, heat mapping, and geovisualization, even when building capabilities from baseline technical knowledge.

- **Systems Thinking and Resource Interdependency:** Effectively evaluating complex urban environments requires moving beyond isolated metrics to identify key variables and map their systemic, dynamic interdependencies.

- **Multistakeholder Collaboration and Validation:** Engaging a diverse network of over 100 participants—including local governments, national statistical institutes, and external technical experts—is vital for validating non-traditional methodologies and fostering the co-creation of actionable solutions.

- **Institutional Scalability and Future Automation:** Documenting and systematically sharing innovative methodologies enables seamless internal knowledge transfer, integration into future strategic projects, and long-term scaling toward automated, continuous, and AI-driven frameworks through strategic academic alliances.



Source: Brazilian Federal Court of Accounts (Tribunal de Contas da União)

Citizen-Centered Performance Auditing: Lessons from Brazil's Federal Court of Accounts

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1. Introduction: When Audits Fail to Capture What Really Matters

Supreme Audit Institutions (SAIs) have increasingly expanded their role beyond legal compliance and administrative regularity to improve public policies and the quality of services delivered to society. Despite this evolution, many audits still focus on bureaucratic processes, governance structures, and institutional indicators, without fully capturing how public-sector shortcomings affect citizens' daily lives.

This challenge has gained growing attention within the international auditing community. INTOSAI and regional organizations such as OLACEFS have emphasized the importance of audits that focus on social impact, public value, and citizens' perspectives when assessing government performance.

In this context, the Brazilian Federal Court of Accounts (TCU) developed the guide Auditing with the Citizen in Focus in 2025. Its central premise is that understanding public problems from the citizens' perspective helps make audits more relevant, effective, and aligned with society's real needs.

2. The "Citizen in Focus" Guide: An Impact-Oriented Audit Approach

To translate the principles of social impact and citizen focus into practical audit methods, the Brazilian Federal Court of Accounts (TCU) developed the guide *Auditing with the Citizen in Focus* in 2025. The guide helps audit teams identify public-sector problems from the perspective of citizens affected by government policies and services.

The approach is aligned with INTOSAI-P 12, which states that Supreme Audit Institutions should contribute to "making a difference to the lives of citizens" by strengthening accountability, transparency, and the generation of public value. The guide broadens the traditional focus of audits by incorporating active listening, user experience analysis, and assessment of policy impacts.

At the core of the approach is the recognition that complex public problems cannot be fully understood through aggregated indicators, document reviews, or formal governance assessments alone. The guide therefore combines quantitative and qualitative evidence while promoting closer engagement among auditors, public managers, specialists, and citizens.

The methodology organizes the audit process into four stages: (1) understanding the problem from the citizen's perspective; (2) assessing the government's response; (3) developing evidence-based solutions; and (4) monitoring whether interventions have improved citizens´ lives. This framework partially shifts the focus of external oversight—from administrative processes to citizens' experiences and policy outcomes.

While preserving established audit techniques, the approach expands auditors' analytical toolkit by citizen interviews, complaint analysis, user journey mapping, empathy maps, collaborative recommendation workshops, and citizen-centered monitoring. These enhance the social relevance, legitimacy, and transformative potential of performance audits.



Source: Brazilian Federal Court of Accounts (Tribunal de Contas da União)

3. Putting the Approach into Practice: Citizen-Centered Audit Experiences

Following the publication of the Auditing with the Citizen in Focus guide, several audit teams at the Brazilian Federal Court of Accounts (TCU) began applying the approach to audits of public policies and services. Although still at an early stage, these experiences have shown how considering citizens' perspectives can influence the definition of audit issues, evidence collection, recommendations, and results monitoring.

The cases presented below reflect different levels of application of the approach. Despite their distinct contexts, they share a common objective: bringing external oversight closer to the experiences of those affected by public policies. Citizen engagement helped reveal problems not captured by government indicators, deepen understanding of policy outcomes, and strengthen mechanisms for monitoring effectiveness over time.

Together, these experiences show the evolution of the citizen-centered approach: from incorporating citizens´ perspectives into problem identification to assessing policy impacts and establishing mechanisms to continuously monitor outcomes perceived by society.

Case 1 – Individual Microentrepreneurs (MEIs): Bringing the Citizen Perspective into the "Brazil Cost" Audit

One of the first applications of the citizen-centered approach was a performance audit focused on the challenges faced by Individual Microentrepreneurs (MEIs) in Brazil. The audit was part of TCU's strategy to address the so-called Brazil Cost—the set of bureaucratic, economic, and structural barriers that increase the cost of doing business and hinder productive activity in the country.

From the planning stage, the audit team sought to understand how entrepreneurs perceived regulatory and administrative obstacles. Rather than relying solely on institutional indicators and formal processes, the audit directly policy users. The methodology combined document and data analysis with interviews, participation in events aimed at microentrepreneurs, and surveys across different regions of Brazil.

This approach changed the traditional audit planning process. Instead of starting from administrative procedures and institutional indicators, the team first identified barriers entrepreneurs considered most significant to their businesses.

With support from TCU's Institutional Relations Secretariat, the team participated in events for at microentrepreneurs and administered 262 questionnaires across Brazil. These interactions identified challenges often overlooked in traditional analyses, including excessive bureaucracy, weak coordination among public agencies, and difficulties accessing information.

Entrepreneurs' perspectives also influenced how audit results were communicated. The report used accessible language and highlighted how identified problems affected the daily lives of microentrepreneurs, illustrating this impact with evidence collected during the audit.

The approach also redefined audit priorities. Beyond government coordination and policy monitoring, the audit emphasized insufficient engagement with microentrepreneurs, limited dissemination of available initiatives, and difficulties understanding regulatory requirements. This shift expanded the audit's focus from predominantly administrative concerns to challenges directly experienced by policy users.

The experience also highlighted methodological challenges. Collecting and analyzing citizens' perceptions required adapting audit techniques, engaging external stakeholders, and investing additional effort to transforming qualitative evidence into reliable findings. Nevertheless, it showed that systematically incorporating citizens' perspectives enhance auditors' ability to identify relevant problems, understand policy effects, and develop recommendations better aligned with society's needs.

Case 2 – Aquaculture: Understanding Barriers Through Producers' Experiences

Another application of the citizen-centered approach was a performance audit of aquaculture governance in Brazil. The audit identified key obstacles to the sector's sustainable development, particularly in those related to project regularization, official information, and reducing informality among producers.

Although aquaculture has grown significantly and has considerable productive potential, many producers still face difficulties accessing public policies, credit, technical assistance, and regulatory processes. Because the sector consists largely of small-scale, often informal producers, the audit combined institutional and regulatory analysis with an assessment of producers´ experience in accessing public policies.

The methodology combined traditional audit tools with interviews, surveys, and field visits, alongside document reviews, risk assessments, and governance analyses.

The approach broadened the audit focus by incorporating producers' perspectives on the main barriers to aquaculture.

Engagement with producers revealed barriers beyond those initially identified, including delays in regulatory processes, legal uncertainty, excessive bureaucracy, and limited access to regulatory information. Producers' perspectives also highlighted the effects of institutional instability and fragmented governance on local economic activity.

Stakeholder analysis, expert panels, and direct observation improved understanding of policy outcomes and reduced the risk of limiting the audit to formal assessment of rules, structures, and administrative processes.

The experience showed that, in sectors dominated by small producers and highly dependent on public policies, direct engagement strengthens performance audits by identifying operational bottlenecks, understanding territorial impacts, and producing assessments that better reflect local realities. It also highlighted challenges related to stakeholder diversity, limited official data, and balancing qualitative and quantitative evidence

Case 3 – Professional Councils: Transparency, Continuous Monitoring, and the Citizen Commitment Initiative

A third experience involved a performance audit of Brazil's federal professional regulatory councils, focusing on the oversight exercised by national councils of their regional counterparts. The audit assessed governance, integration, consistency, and transparency in professional regulation.

Although initially structured around governance and oversight, the audit evolved to incorporate social effectiveness and citizen participation. It recognized that professional regulation directly affects the quality and safety of services provided to society.

The methodology included surveys, institutional maturity assessments, and indicators on regulation, oversight, technological integration, and transparency. It also incorporated mechanisms to assess effectiveness from society´s perspective.

One of the audit's most innovative outcomes was the proposed Citizen Commitment Initiative.

The initiative proposed effectiveness indicators developed with societal participation, combined with continuous monitoring and public disclosure of results. Rather than focusing only on compliance with audit recommendations, it sought to connect external oversight more closely to society's perception of professional regulation outcomes.

TCU authorized continuous monitoring through periodic surveys and public disclosure of indicators via a dedicated dashboard. The audit also proposed a working group to institutionalize the Citizen Commitment Initiative, including monitoring, evaluation, and effectiveness targets related for audited policies and services.

Unlike the previous cases, where citizen participation focused on collecting perceptions during audit, this experience extended the approach by creating permanent mechanisms to monitory the results of audits from society's perspective.

The experience also highlighted challenges in defining effectiveness indicators, ensuring representative participation, and balancing institutional independence, operational feasibility, and societal expectations. Nevertheless, it demonstrated the potential to enhance transparency, strengthen social accountability, and incorporate continuous monitoring of impacts as perceived by society.

4. Lessons Learned and Challenges of a Citizen-Centered Approach

The early implementation of the Auditing with the Citizen in Focus guide has highlighted the benefits and challenges of incorporating citizens' perspectives into performance audits. Across different contexts, the approach helped audit teams better understand public-sector problems, connect audit work to people's lived experiences, and produce assessments that better reflect the real effects of government actions.

One of the main benefits was identifying issues unlikely to emerge from document reviews, institutional indicators, or formal governance assessments alone. Interviews, surveys, field visits, direct observation, and other listening mechanisms helped reveal barriers faced by citizens in their daily interactions with public services, particularly in situations characterized by excessive bureaucracy, fragmented institutional arrangements, limited access to information, and service delivery challenges.

The cases also showed that a citizen-centered perspective can influence audit questions, risk prioritization, and recommendations. In several instances, administrative shortcomings came to be understood through their impact on citizens, entrepreneurs, producers, and users of public services users.

Another lesson relates to communication. Accessible language, practical examples, and transparency mechanisms helped bring audit results closer to non-specialized stakeholders, strengthening audit legitimacy and supporting social accountability.

The experiences highlighted important methodological challenges. Collecting and analyzing qualitative evidence requires audit practices while ensuring representative participation, validating information, and balancing qualitative and quantitative evidence. Audit teams also faced constraints related to time, resources, and the skills needed for more intensive engagement with citizens and stakeholders.

Another challenge involves translating citizens' perspectives into objective audit criteria and measurable effectiveness indicators. While engagement with policy users expands auditors' understanding of public-sector problems, further methodological development is needed to integrate these insights into audit planning, execution, and follow-up.

5. Conclusion

As public policies become more complex and expectations of government effectiveness grow, Supreme Audit Institutions face increasing pressure to demonstrate not only compliance and accountability, but also tangible contributions to improving citizens' lives.

Overall, the results suggest that a citizen-centered approach can strengthen impact-oriented audits, enhance public value, and bring external oversight closer to society's needs. Rather than replacing traditional methods, it complements them with tools that make performance audits more relevant, understandable, and responsive to citizens' realities.

TCU's experience with the *Auditing with the Citizen in Focus* guide illustrates how incorporating citizens' perspectives can help Supreme Audit Institutions produce audits that are not only technically sound, but also more meaningful to society. As SAIs seek to maximize the public value of their work, citizen-centered auditing offers a practical way to make audit results more relevant, impactful, and aligned with the needs of the people they ultimately serve.

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Source: Board of Audit and Inspection of Korea

30 Years of Performance Audit in the Board of Audit and Inspection of Korea: Development and Achievements

Authors: Ms. KIM Nanyoung, Mr. YUN Sungwon, Ms. OH Sunyoung, Board of Audit and Inspection of Korea

1. Introduction

Performance audit aims to secure government accountability by examining the economy, efficiency, and effectiveness of government activities. Although INTOSAI established universal standards for performance audit, the specific manners of how each SAI operates, shows different developmental stages and outcomes of their performance audits are all different depending on their own historical background and political, administrative landscape.

The Board of Audit and Inspection of Korea (BAI) is a constitutional agency[1] established in 1963 with dual function of audit and inspection. In those early years, BAI leveraged such dual functions in performing its audits that highly focused on compliance. This contributed to establishing discipline in the public sector and largely eliminating corruption. Years later, as the economic development, democratization and informatization progressed, the Korean government's operational approach shifted towards emphasizing performance. Accordingly, BAI adopted performance audit in 1994 to overcome the limitations of compliance audit and modernize its audit practices.

Over the 31-year period from 1994 to 2024, BAI conducted a total of 4,175 audits, out of which 445 audit cases were performance audit (14 on annual average, 11% of the total).

2. Progress of Performance Audit Evolution in BAI

The development stages of performance auditing in BAI can be characterized as four phases—Oversight, Insight, Deep Insight, and Foresight—considering both external factors (changes in politics, economy, technology, and government operational paradigms) and internal factors (guiding philosophies of Chairs, strategic goals, and operational directions). To ensure the effective operation of performance audit, BAI has continuously reformed and advanced such foundations as legal frameworks, human resources, organizational support structure, IT technology, etc.

Oversight (1994-2003)

BAI introduced performance audit on a full scale in 1994. In 1995, it established a legal basis for performance audit by incorporating provisions on recommendations and notifications as audit results into the Board of Audit and Inspection Act. Furthermore, to enhance expertise in conducting performance audit, BAI introduced special recruitment schemes for lawyers and accountants in 1996 as well as for those experts with master's and doctoral degrees in 2000. During this period, BAI set audit objectives mostly for examining the efficiency of government operations. Thanks to its power to do both audit and inspection, BAI could achieve significant outcomes in improving public sector efficiency and preventing budget waste and fiscal leakage.

Footnote

1. Following the establishment of the Government of the Republic of Korea, the Board of Audit (responsible for financial audit) was also established in August, 1948, followed by the Commission of Inspection (responsible for inspecting government officials' works) in December of the same year. To resolve the duplication of audit and administrative works, these two organizations were merged into today's BAI, a constitutional agency whose authorities were mandated by the 5th Amendment of the Constitution. ↩

Case Study: Implementation Status of Structural Improvement Projects for Rural and Fishing Communities (1998)

Background: In response to the globalization and liberalization of agriculture, the government implemented a structural reform plan for rural and fishing communities (KRW 42 trillion, about USD 40 billion, over 10 years).

Audit Findings: The audit identified improper subsidy payments, losses caused by project delays (appr. KRW 235 billion, about USD230 million), and shortfalls in business targets.

Implementation: Recollected appr. KRW 300 billion (about USD 300 million) in improper subsidies, tightened selection criteria for new operators, and integrated previously dispersed organizations responsible for agriculture and livestock-related sectors.

Impact: Enhanced fiscal efficiency by preventing large-scale budget waste, and improvement in speed and convenience of administrative services.

Insight (2004-2007)

As the government strengthened results-based governance by introducing measures such as performance-based budgeting system, BAI shifted its operational approach toward performance audit under the banner of "System Audit." In 2005, BAI established an operation manual on performance audit and founded the Evaluation Research Institute (ERI) as a specialized institution to supplement the expertise required for performance audit. During this period, BAI set most of its audit focuses on identifying root causes of problems to improve government systems, introduced a continuous monitoring system and conducted monitoring of policies and projects, established an electronic audit system for internal operations, and enhanced the expertise of its performance by utilizing the professional policy analysts at the ERI.

Case Study: Status of the Social Service Job Creation Project (2007)

Background: 11 ministries launched 43 job programs worth KRW 1.3 trillion to meet the surging demand for social services and resolve unemployment.

Audit Findings: The audit identified 6 unsuitable programs by utilizing a model newly developed by the Evaluation Research Institute's researchers, in response to criticism regarding the lack of a job suitability evaluation model.

Implementation: The Ministry of Planning and Budget established common wage standards and reflected them in the 2008 budget by adopting the BAI's evaluation indicators.

Impact: Contributed to public livelihood stability through efforts such as income guarantees for program participants, and enhanced fiscal efficiency by building an evidence-based program evaluation system.

Deep Insight (2008- 2019)

At this stage, BAI channeled its efforts toward utilizing such audit techniques as in-depth analysis and administrative data on a full scale. In line with the trend of informatization spread across the society, BAI promoted the computerization of audit works, establishing the Open Audit System (OASYS) in 2014. Furthermore, in 2018, it introduced the Best Audit and Inspection System for Rule-based Observation Network (BARON), a system that collects a wide range of public data on finance, licensing, education, etc., and then processes them into audit-ready materials for auditors, according to auditors' request.

Case Study: Vulnerable Groups in Labor Market Employment Programs (2018)

Background: Overlapping support and beneficiary omissions caused by siloed operations among ministries persisted, despite a KRW 18 trillion budget.

Audit Findings: The audit identified a mismatch with actual demand due to improper target selection, which stemmed from blindly classifying everyone aged 55 and older as a vulnerable group.* Analyzed by utilizing large-scale administrative data, including information from the Ilmoa system, WorkNet, and National Health Insurance records.

Implementation: Abolished the practice of automatically classifying certain age groups as vulnerable, and revised the selection process to prioritize genuinely vulnerable populations and youth.

Impact: Promoted public welfare stability by increasing the participation of vulnerable groups and enhanced fiscal efficiency through data-driven analysis.

Foresight (2020-2024)

Since 2020, BAI's audits have been designed to examine the government's response systems for future risks, such as the changes in demographic structure, climate crisis, and technological innovation. BAI also established an audit planning system, which stands to help BAI have foresight on future risks by conducting professional risk analyses of so-called "High-risk Areas". In addition, BAI established the Bureau of Audit on Strategic Issues.

Case Study: Climate Crisis Adaptation and Response Status Ⅰ (2023)

Background: Checked scientific response system in the water and food sectors to prepare for economic losses caused by climate change.

Audit Findings: Water: Identified a twofold surge in water shortages compared to previous forecasts when applying future climate scenarios. **Food:** Identified policies that failed to adopt possibilities of a decline in crop yields and overseas supply plunges driven by climate change.

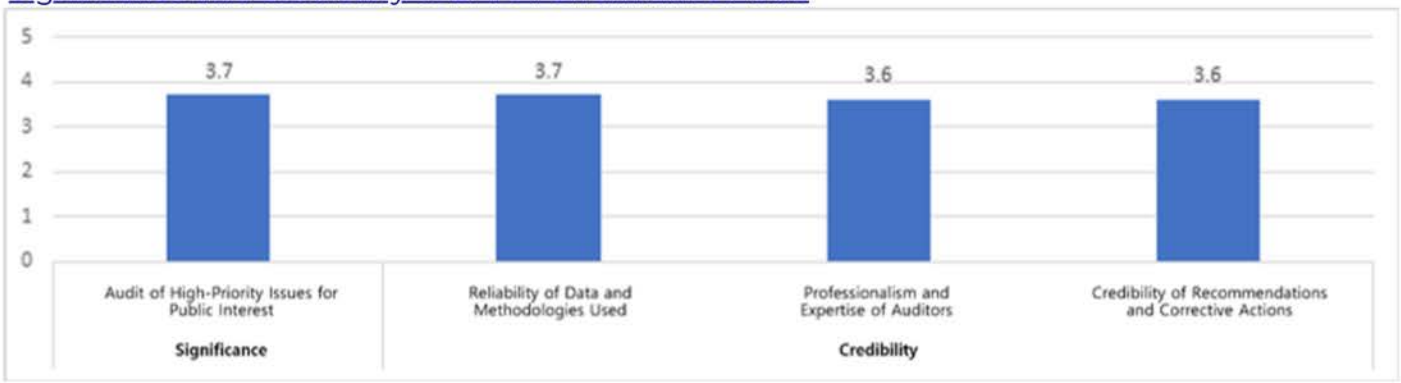
Implementation: Introduced climate scenario-based forecasting in water, food, and fisheries sectors, built a comprehensive water management platform, and established pan-governmental climate adaptation projects.

Impact: Ensured public safety by strengthening data-driven scientific water security policies, and established a national response system that actively reflects climate crisis variables.

3. Outcomes and Impacts of BAI's Performance Audit

BAI's performance audits have been highly evaluated for their excellence across the entire audit cycle, in terms of significance of audit topic selection, reliability of audit evidence and methodologies, audit productivity, and the effectiveness and impact of audit results. In particular, in a survey amongst public officials of government agencies subject to BAI's audit, strong ratings were given to the significance of audit topics—namely, whether BAI audits address matters of major public concern—and to the reliability of the audit practices, including audit evidence and methodologies underpinning audit findings and recommendations.

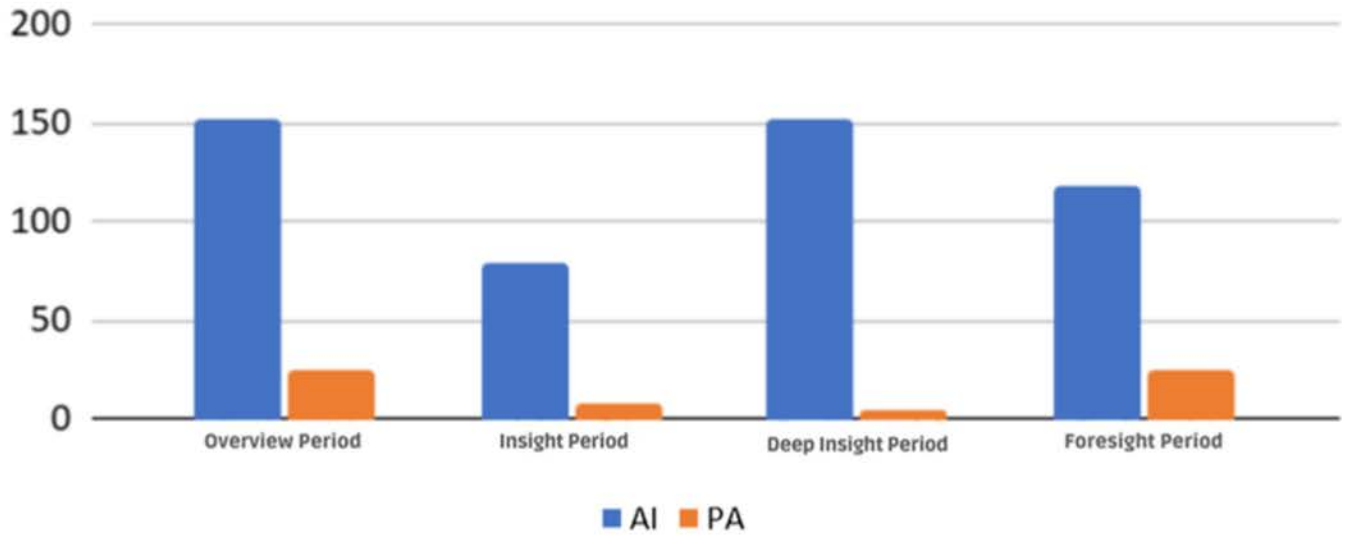
Significance and Credibility of BAI's Performance Audit



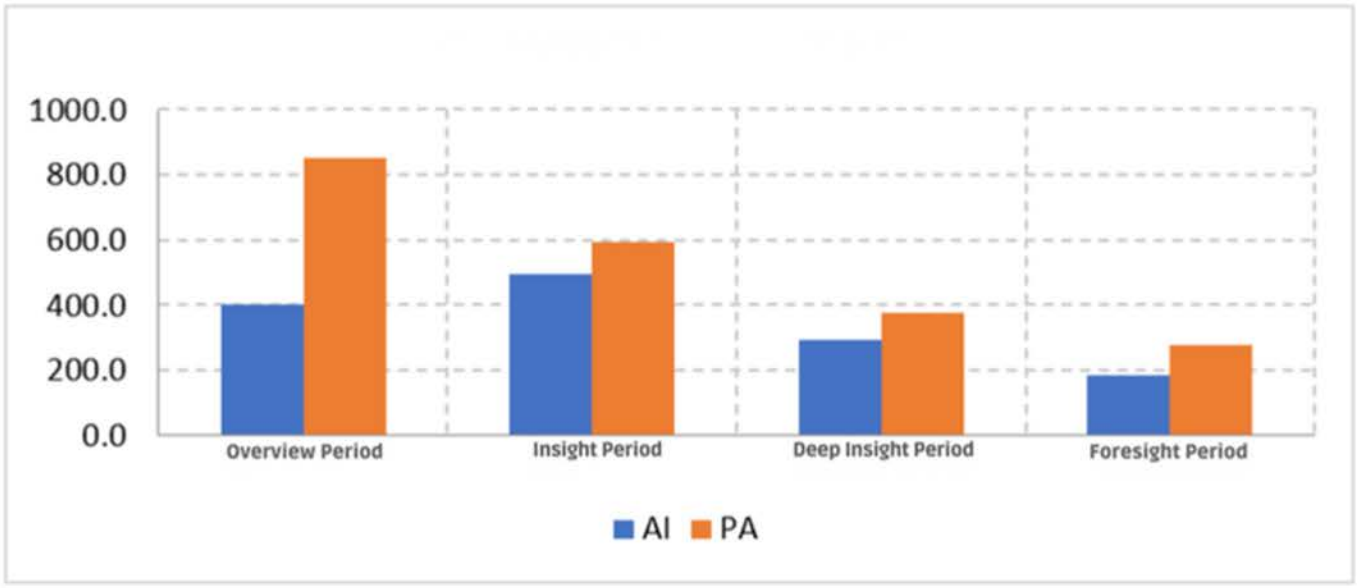
Source: Results of survey among the public officials of government agencies subject to BAI's audit (from Sep. 1, to Sep. 30, 2025), Board of Audit and Inspection of Korea

In terms of audit productivity, performance audit appears to be different from other types of audit, in that: they are fewer in the number of audits conducted, require greater staff resources, and generally take longer to complete. Nevertheless, the financial benefits generated per audit have increased rapidly over time. During the Oversight period, the financial impact per performance audit was slightly higher than that of other audit types, while it jumped to five times higher during the Foresight period.

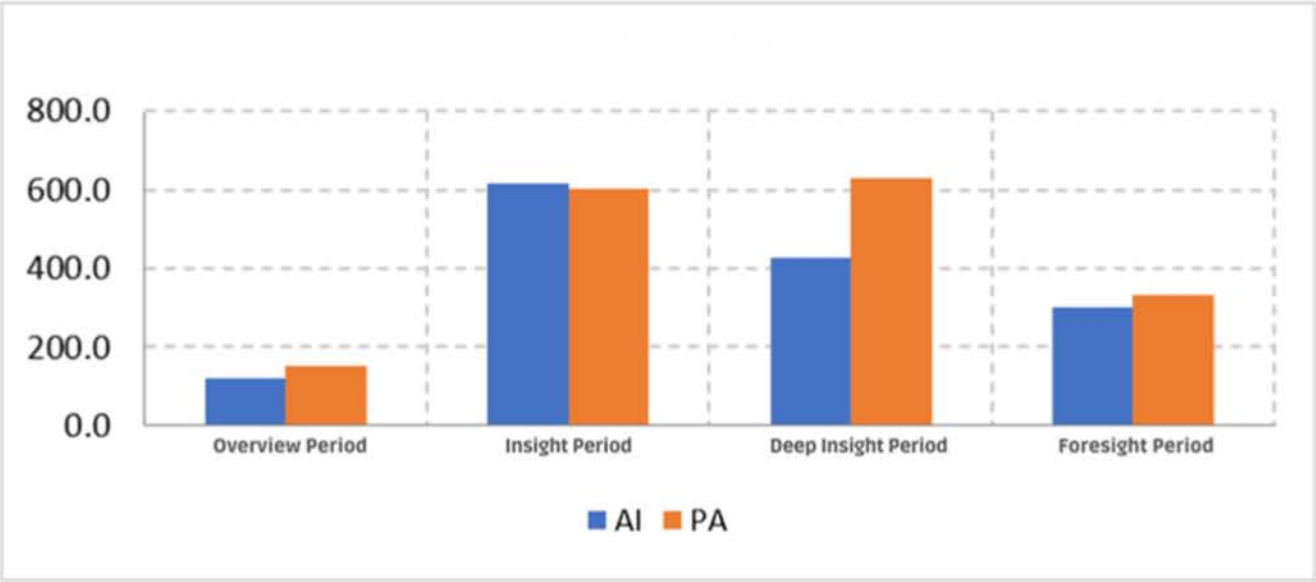
Productivity of BAI's Performance Audit



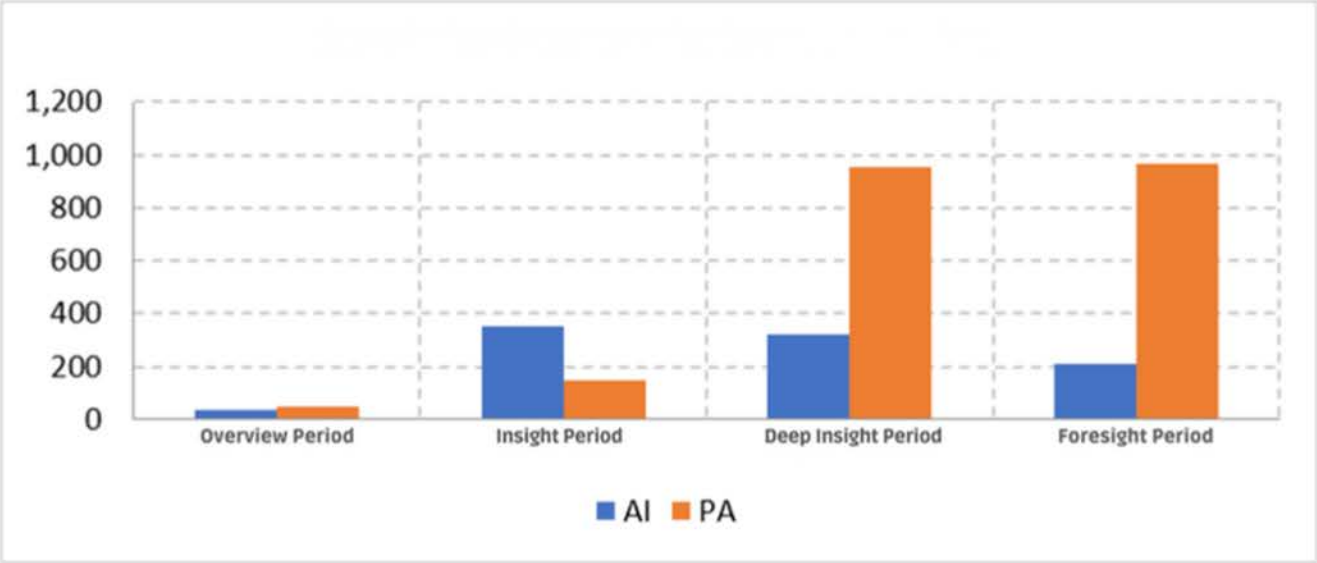
Number of of audits conducted. All types (blue) v. performance audit (orange). Source: Board of Audit and Inspection of Korea



Staff-Days per Audit: All audits (blue) v. performance audits (orange). Source: Board of Audit and Inspection of Korea



Average audit process period. All types (blue) v. performance audit (orange). Source: Board of Audit and Inspection of Korea

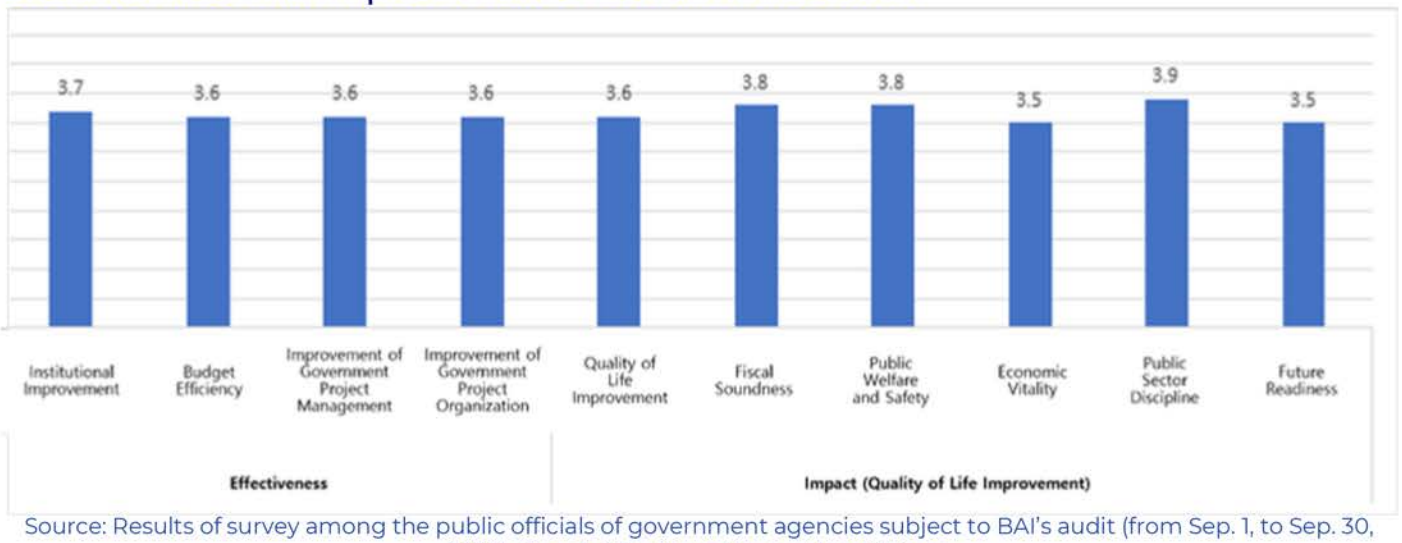


Financial Benefits per Audit Finding (Unit: KRW 100 million). All types (blue) v. performance audit (orange). Source: Board of Audit and Inspection of Korea

In terms of the effectiveness of audit outcomes, the audits have been well evaluated across all categories, including contribution to institutional improvements, enhancement of the efficiency of budget management, improvement in the operation of government programs, and advancement of organizational management.

The impact of audits through these administrative improvements has also received laudable evaluations across all categories, including sound public finances, public safety and well-being, economic vitality, public sector integrity and discipline, and preparedness for future challenges.

Effectiveness and Impact of BAI's Performance Audit



Source: Results of survey among the public officials of government agencies subject to BAI's audit (from Sep. 1, to Sep. 30, 2025), Board of Audit and Inspection of Korea

4. Conclusion

Over the past 30 years, the performance audits conducted by the Board of Audit and Inspection of Korea have evolved from financial efficiency oversight (Oversight) to program analysis that identifies root causes and provides recommendations on things to improve (Insight), data-driven in-depth diagnostics (Deep Insight), and anticipation of future risks (Foresight).

This evolution has been supported by key elements of BAI's audit framework, including the power to conduct audit and inspections together, the expansion of specialized personnel and research organizations coupled with enhanced training, the introduction of data analytics systems and wider application of scientific analytical methodologies, and the establishment of professional risk-based audit planning.

Since 2026, BAI's performance audits have further evolved toward a "citizen-centered audit" approach, placing greater emphasis on ensuring that audit results are translated more rapidly into tangible improvements in citizens' quality of life and everyday well-being. In line with this shift, BAI has expanded its performance audit objectives beyond economy, efficiency, and effectiveness to place greater emphasis on equity, human rights, and other public values.

It is hoped that the experience of BAI will serve as a useful reference for Supreme Audit Institutions as they continue to develop and enhance their performance audit practices in ways that reflect their own legal and institutional contexts.



Source: Adobe Stock Images, Golden Sikorka

Innovative Approaches in Performance Auditing: Comparative Lessons from Supreme Audit Institutions

Author: Alfredo Campos Lacoba, Auditor – Deputy Director, Presidency of the Audit Section, Spanish Court of Audit

Abstract

Performance auditing is undergoing significant transformation within the international public auditing community. Supreme Audit Institutions (SAIs) are increasingly moving beyond traditional economy-efficiency-effectiveness assessments toward more sophisticated evaluation-oriented approaches based on data analytics, impact assessment, risk analysis, and evidence-based policymaking.

This article presents a comparative analysis of innovative methodologies and practices identified in the submissions to the first Award of the INTOSAI Working Group on the Evaluation of Public Policies and Programs (WGEPPP). Drawing on experiences from Brazil, Costa Rica, France, the Czech Republic, Morocco, Romania, Spain, and Thailand, the paper identifies emerging trends shaping the future of performance auditing.

The study highlights innovative tools such as geospatial analysis, econometric models, artificial intelligence, maturity scales, visual scoring systems, data triangulation, and participatory methods. It also examines how SAIs are addressing complex and cross-cutting public policies through multidisciplinary and data-driven approaches.

The article argues that these innovations strengthen the capacity of SAIs to generate meaningful findings, improve policy evaluation, and enhance public value and accountability.

1. Introduction

Performance auditing has evolved considerably over the last decade. Increasingly complex public policies, growing demands for accountability, and the expansion of evidence-based governance have pushed SAIs to adopt more advanced analytical and evaluative approaches.

This transformation is reflected in recent initiatives promoted within the INTOSAI community, particularly through the Working Group on the Evaluation of Public Policies and Programs (WGEPPP). The first WGEPPP Award showcased innovative audit practices capable of improving the evaluation of public programs and generating more useful insights for decision-makers and citizens.

The submissions reveal a common trend: performance auditing is progressively incorporating techniques traditionally associated with policy evaluation, data science, behavioural analysis, and impact assessment. Rather than focusing exclusively on compliance or operational deficiencies, SAIs are increasingly examining whether public interventions achieve their intended outcomes and societal impacts.

The comparative analysis of these international experiences offers valuable lessons for the modernization of external public auditing.

2. Beyond Traditional Performance Audit: Emerging Evaluative Approaches in Supreme Audit Institutions

One of the clearest trends identified across the analysed experiences is the transition from traditional performance auditing toward evaluation-oriented auditing.

Several SAIs now apply methodologies that explicitly assess intervention logic, policy coherence, outcomes, and impacts. This shift is particularly visible in the work developed by the French Cour des comptes, the Brazilian Federal Court of Accounts (TCU), and the State Audit Office of Thailand.

For example, the French evaluation of biogas development policies combined econometric techniques, benchmarking, and administrative databases to estimate the real economic impact of public support mechanisms on agricultural resilience. Similarly, France's evaluation of alternatives to imprisonment used statistical and econometric analysis to assess recidivism and reintegration outcomes, demonstrating how evidence-based approaches can strengthen auditing in politically sensitive sectors.

These experiences illustrate how SAIs are increasingly incorporating analytical techniques capable of addressing complex policy questions that cannot be answered through conventional audit procedures alone.

3. Data-Driven Auditing and Advanced Analytics

A second major trend is the growing use of advanced data analytics and digital tools in performance auditing.

The Brazilian TCU provides some of the most innovative examples. Its audit of the National Immunization Program combined multivariate statistical models, large-scale surveys, field inspections, and interactive dashboards developed in Power BI, an interactive data visualization, database management, and data modeling software. The audit also incorporated artificial intelligence tools to support the synthesis and organization of findings.

In another Brazilian audit concerning social policy databases, auditors combined automated cross-checking of administrative records with household verification visits to identify inconsistencies in poverty-related registries. This triangulation methodology strengthened the reliability of findings and enabled the quantification of financial impacts associated with poor-quality data.

Costa Rica's audits also demonstrate the growing importance of territorial and geospatial analytics. The audit on sustainable urban services used QGIS geoprocessing techniques, clustering analysis in R, and Gini coefficients to identify inequalities in access to public services within intermediate cities. This territorial perspective allowed auditors to detect patterns that would have remained invisible using traditional audit techniques.

These examples show how data-driven methodologies improve the depth, robustness, and credibility of audit conclusions while enabling auditors to address increasingly complex policy environments.

4. Structuring Professional Judgment through Innovative Methodologies

Another relevant innovation concerns efforts to systematize and structure professional judgment in performance auditing.

The Czech Supreme Audit Office developed a methodological framework based on graduated effectiveness and efficiency scales applicable to public programs and subsidies. Rather than relying on purely subjective assessments, the methodology establishes clearly defined criteria and descriptors for different performance levels. This approach improves consistency among audit teams, facilitates aggregation of results, and enhances transparency in communication with audited entities.

Brazil's energy transition audit introduced another innovative tool: a visual scoring system combining qualitative judgment with color-coded quantitative representations. The audit also used an "Audit Canvas" methodology to organize risks, actors, objectives, and evidence sources visually during the planning phase.

Such methodologies contribute to reducing arbitrariness and increasing the comparability and communicability of audit findings.

5. Auditing Complex Governance Systems

Many of the analysed audits focus on policies characterized by multi-level governance, institutional fragmentation, and cross-cutting objectives.

The Brazilian coordinated audit of the National Immunization Program involved cooperation between the Federal Court of Accounts and twenty subnational audit institutions. The audit adopted a Whole-of-Government perspective to assess coordination among institutions responsible for vaccine logistics and implementation.

Similarly, Morocco's audit of delegated waste management contracts analysed the entire contractual cycle, from planning and procurement to execution and monitoring. The risk-based approach revealed how weaknesses in governance structures affected service quality, financial sustainability, and policy coherence.

Romania's audit of civil defense systems also illustrates the importance of systemic auditing approaches. Through extensive fieldwork and administrative data analysis, auditors evaluated institutional resilience and preparedness in a context of growing geopolitical risk.

These experiences demonstrate that modern performance auditing increasingly requires systemic analysis capable of capturing interactions among institutions, governance arrangements, and policy instruments.

6. Participation, Communication, and Citizen-Centered Auditing

Several audits reveal a growing emphasis on participation, communication, and user-centered approaches.

Costa Rica's audit of refugee status procedures incorporated empathy maps, civil society workshops, and stakeholder participation mechanisms to better understand users' experiences with migration services. Artificial intelligence tools were also used to support interview transcription and communication activities.

These participatory methodologies represent a significant evolution in public auditing. They allow SAIs to complement quantitative evidence with qualitative insights derived from beneficiaries and stakeholders.

Communication itself is also becoming a strategic dimension of auditing. Several institutions used visual scoring systems, dashboards, audiovisual materials, and simplified summaries to make audit findings more accessible to non-specialized audiences.

This trend reflects a broader understanding of audit impact: findings only generate public value if they are effectively understood and used by decision-makers, stakeholders, and citizens.

7. Measuring the Public Value of Auditing

One of the most innovative contributions identified in the comparative analysis is the growing interest in measuring the social value generated by auditing itself.

The Spanish Court of Audit proposed a Social Return of Public Auditing (SRPA) framework designed to estimate the societal impact of performance audits. The proposal combines qualitative and quantitative dimensions and is explicitly linked to INTOSAI-P12 principles concerning the value and benefits of SAIs.

The framework includes four innovation-oriented laboratories:

- Data LAB;
- Social LAB;
- Public Policy Evaluation LAB;
- Cross-cutting Sustainability LAB.

The proposal also explores advanced analytical techniques such as machine learning models, institutional simulations, and Shapley-value analysis to compare the potential effects of traditional versus innovation-oriented audit models.

Although experimental, this initiative reflects an important institutional evolution: SAIs are no longer focused solely on auditing public value creation by governments but are increasingly seeking to assess and demonstrate their own contribution to better governance and societal outcomes.

8. Conclusions

The comparative analysis of the WGEPPP award submissions demonstrates that performance auditing is entering a new methodological phase characterized by innovation, interdisciplinarity, and stronger orientation toward policy impact.

Several converging trends emerge from the international experiences analysed:

- Greater reliance on data-driven analysis and advanced analytics;
- Increased use of econometric and geospatial techniques;
- Expansion of participatory and citizen-centered approaches;
- Development of structured evaluation methodologies;
- Growing attention to governance complexity and institutional resilience;
- Stronger emphasis on communication and measurable public value.

These innovations enhance the ability of SAIs to evaluate complex public policies, produce evidence-based conclusions, and contribute meaningfully to public sector improvement.

The experiences examined also confirm that innovation in performance auditing does not weaken the rigor of external control. On the contrary, advanced analytical tools, multidisciplinary approaches, and evaluation-oriented methodologies strengthen the credibility, relevance, and societal impact of public auditing.

As governments face increasingly complex challenges related to sustainability, inequality, digital transformation, and institutional resilience, SAIs will need to continue evolving toward more sophisticated and evidence-oriented audit models. International cooperation and knowledge sharing within INTOSAI will remain essential drivers of this transformation.



Source: Adobe Stock Images, madedee

Data Science to Measure Out-of-Pocket Costs for Women with Breast Cancer

By Appoline Chariot, data scientist at the French Cour des comptes

What do women with breast cancer actually pay for their treatment? Providing a rigorous answer based on available data poses a significant methodological challenge.

An investigation by the Cour des comptes, the French SAI, focused on breast cancer prevention and treatment, with the goal of better understanding the financial impact of the disease on patients.

To answer this question, the audit team consulted the SAI's "Data Analysis and Science" department (DASD), which drew on data from the National Health Data System (SNDS). This data enabled the development of a measure of out-of-pocket costs after reimbursements from mandatory health insurance coverage for women with breast cancer.

Developing a Measurable Indicator Based on Medical-Administrative Data

To measure out-of-pocket costs, we must first clarify this concept, which has no single definition and does not exist directly in medical-administrative databases.

SNDS data allowed the Cour des comptes to observe the care received and the reimbursements made by mandatory health insurance for each patient. However, they do not allow to reconstruct the actual final cost borne by the patient, as reimbursements from supplemental health insurance and expenses related to non-reimbursed care are not included. The analysis therefore focused on out-of-pocket costs after reimbursement by mandatory health insurance and before any potential reimbursement by supplemental health insurance, with the actual out-of-pocket costs depending on the level of supplemental coverage.

The role of the data scientist is not limited to the implementation of quantitative methods: it requires a detailed understanding of the healthcare system, in this case, and of public policy issues – an essential prerequisite for identifying relevant data, interpreting its limitations, and constructing robust indicators. This expertise enables the data scientist to bridge the gap between public policy evaluation questions and their analytical formalization.

Reconstructing Out-of-Pocket Costs from Billions of Data Points

The analysis focused on a cohort of nearly 29,000 women diagnosed with breast cancer in 2022. For each of them, all expenses observed during the two years following diagnosis were examined: hospitalizations, medical consultations, medical procedures, medications, medical devices, and medical transportation.

Out-of-pocket costs after mandatory health insurance cover a range of different expenses. The first component corresponds to the so-called "enforceable" portion, the difference between the reference rate and the reimbursement provided by mandatory health insurance. A second component results from the freedom to set prices associated with certain healthcare services, particularly in the form of extra fees (above standard tariffs) charged by healthcare professionals.

Reconstructing Out-of-Pocket Costs from Billions of Data Points

The analysis focused on a cohort of nearly 29,000 women diagnosed with breast cancer in 2022. For each of them, all expenses observed during the two years following diagnosis were examined: hospitalizations, medical consultations, medical procedures, medications, medical devices, and medical transportation.

Objectively Assessing the Role of Extra Fees Charged by Healthcare Professionals

The findings have provided objective data on phenomena that are often discussed but rarely quantified: in the two years following their diagnosis, women with breast cancer incur an average out-of-pocket cost – after reimbursement by mandatory health insurance and before any potential reimbursement by supplemental health insurance – of €1,550 out of a total expenditure of €37,280.

Beyond this average amount, the results highlight the central role of extra fees charged by healthcare professionals in determining the out-of-pocket costs. This phenomenon is particularly pronounced for certain medical specialties, such as radiation oncologists, gynecologists, and surgeons, and in certain regions.

The analysis also shed light on specific situations, such as breast reconstruction performed in the private sector, which are an integral part of the breast cancer care pathway but can result in significant out-of-pocket costs due to extra fees charged by healthcare professionals.

It was important to objectively assess the impact of these extra fees on out-of-pocket costs. Indeed, their coverage by supplemental health insurance varies greatly depending on the policy, which is likely to exacerbate socioeconomic inequalities regarding healthcare expenses.

An Award at the EMOIS 2026 Conference

The results of this analysis, presented at the EMOIS 2026 medical information conference, received the award for best poster presentation for the poster titled “Out-of-Pocket Costs for Women with Breast Cancer After Reimbursement by Mandatory Health Insurance.”

Cour des comptes
FRANCE

Out-of-pocket expenses for women with breast cancer after reimbursement by mandatory health insurance



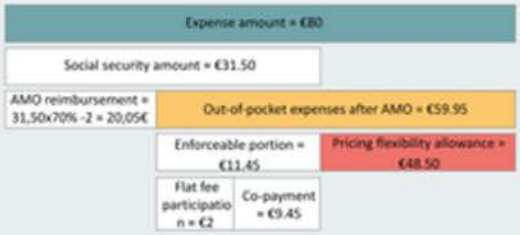
Introduction

Objective: To evaluate the out-of-pocket expenses for women with breast cancer after reimbursement by compulsory health insurance, using the National Health Data System (SNDS).

Components of the out-of-pocket expenses after reimbursement by mandatory health insurance:

- **Applicable portion: co-payment, fixed contributions, medical deductibles, daily hospital allowances;**
- **Part related to pricing freedom: excess fees, unregulated prices on certain medical devices.**

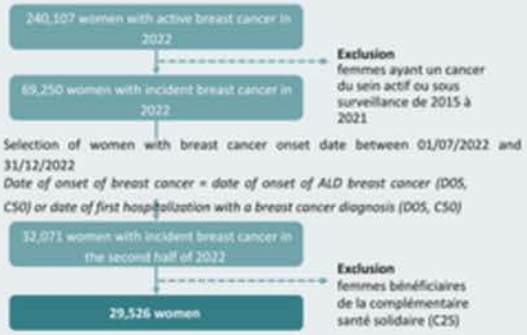
Example of an €80 consultation in town (medical oncologist, sector 2 OPTAM in 2025):



Expenses related to long-term illness: so-called "100%" coverage, no co-payment (but flat-rate contribution and pricing freedom).

Methods

Selection of the study population: 29,526 women with incident breast cancer in the second half of 2022 (excluding C2S beneficiaries), identified from the data of the Pathology Mapping1.



Scope of expenditure: inpatient stays + outpatient procedures and consultations + outpatient care (excluding optical, dental and hearing aids) Includes expenses related and unrelated to breast cancer.

Calculation of amounts: amounts of expenses and components of the out-of-pocket expenses calculated using the RAC2 database algorithm. Cumulative amounts over the first two years following the onset of cancer.

Results

Total expenditure

Moyennes				
Total expenditure	Reimbursement by the AMO 35	Outstanding balance	Opposable part	Part of the tariff freedom
37 276€	35 727€	1 549€	890€	659€



On average, over the first 2 years after a cancer diagnosis:

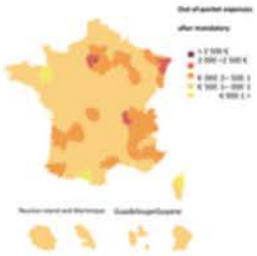
- 96% of total expenses are covered by mandatory health insurance
- €1,549 in out-of-pocket costs remain after reimbursement by mandatory health insurance
- 43% of the share is linked to tariff freedom (excess fees, free prices on certain medical devices) and 57% of the share is enforceable (co-payment, flat-rate contributions, medical deductibles, daily hospital allowances).

Excess fees

- **Specialist doctors in town: out-of-pocket expenses related to the highest overruns for radiotherapy oncologists, gynecologists/obstetrician-gynecologists and surgeons.**
- **Breast reconstruction procedures in the private sector: €1,332 out-of-pocket cost on average, due to excess fees.**

Social and geographical disparities

- **Departmental**: average out-of-pocket expenses are lower in Ille-et-Vilaine (€990) than in Yvelines (€2,330), with comparable total expenditure.
- Median income and density of the municipality: greater exposure to tariff freedom in favoured and dense municipalities (price freedom share: €1504 on average in the richest, €421 in the poorest).



Discussion

Health insurance covers a large part of the expenses for women with breast cancer, but a sometimes high out-of-pocket expense may still exist despite the long-term illness scheme.

In the absence of information on supplementary health insurance reimbursements, it should be noted that for the general population:

- The enforceable portion is largely covered: 98% of insured persons have a so-called "responsible" contract3.
- The portion related to pricing freedom is unevenly covered: 10% of group contracts and 40% of individual contracts do not cover excess fees3.

Abbreviations

ALD: long-term illness; AMO: mandatory health insurance; OPTAM: controlled pricing option; MCO: medicine, surgery, obstetrics

Resources

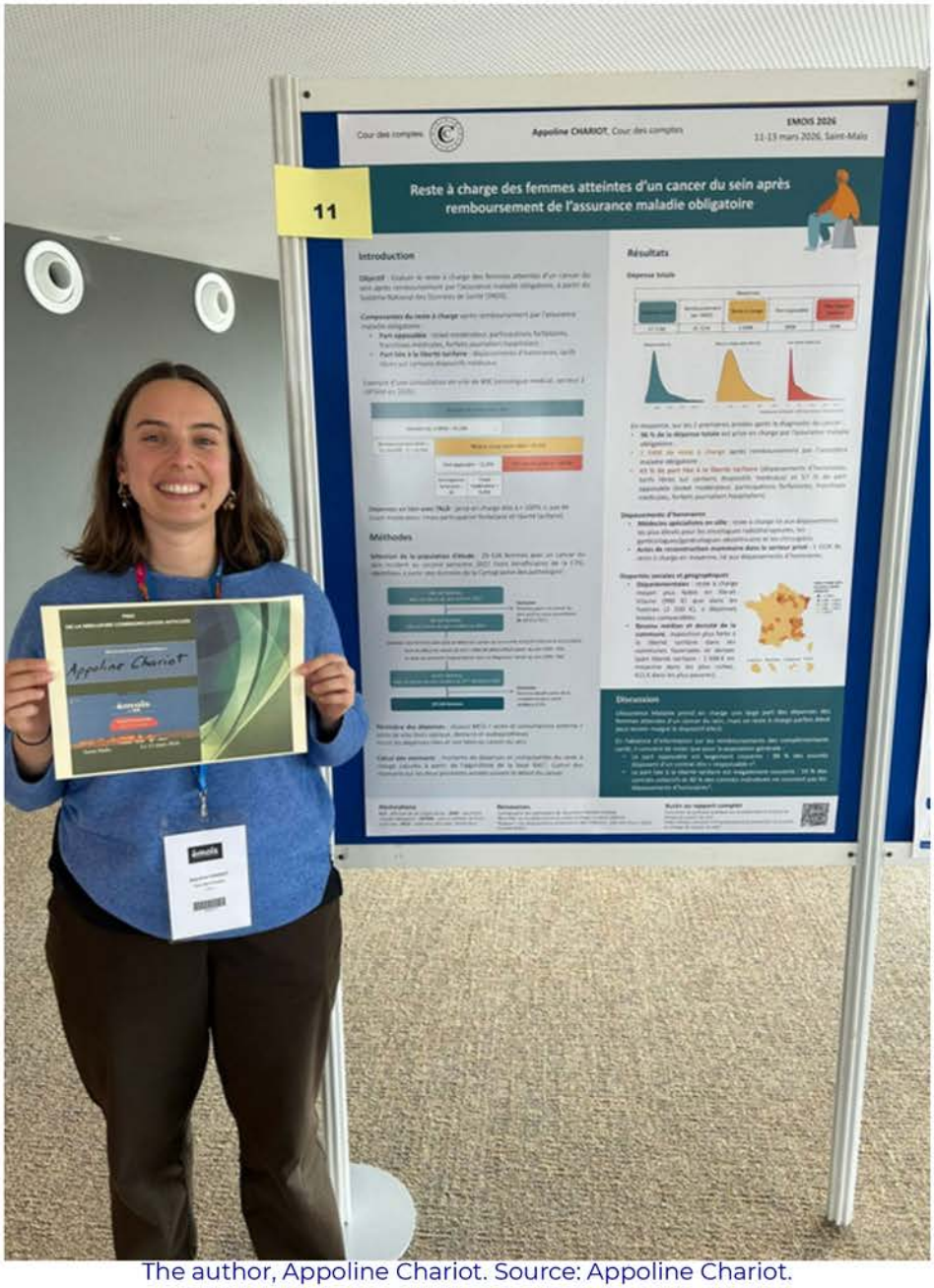
[1]Mapping of pathologies covered by the National Health Insurance (CNAM)
[2]RAC database on healthcare expenses and out-of-pocket costs (DREES)
[3]Report "Physician Fee Overruns: Current Situation" (2025, HCAAM-IRDES)

Access the full report

Public policy evaluation on the prevention and management of breast cancer: https://www.ccomptes.fr/fr/publications/la-prevention-et-la-prise-en-charge-du-cancer-du-sein

This award highlights the scientific and practical value of work conducted as part of a public policy evaluation. It also illustrates the role of the French SAI's "Analysis and Data Science" department: transforming complex data into useful information to inform findings, objectively assess observed inequalities, and enhance the relevance and impact of public policy evaluations.

Link to the report and its methodology document (in French)



The author, Appoline Chariot. Source: Appoline Chariot.



Source: Adobe Stock Images, bestforbest

Making a Difference Through Data: How Data Analysis Enhances Performance Audits and Evaluations

Author: Mario Luketić, Secretary General of the INTOSAI Working Group on Evaluation of Public Policies and Programs (WGEPPP), Swiss Federal Audit Office

Data has become a central part for the management of complex public programmes. It helps to highlight trends, better understand impacts and identify the need for policy adjustments. For Supreme Audit Institutions (SAIs), the question is therefore no longer whether data analysis should be used in performance audits and evaluations. Rather, the key issue is how data analysis can be planned, prepared and integrated into audit work in such a way that it is driven by the audit questions and contributes to better insights, more convincing recommendations and, ultimately, greater impact.

Within this context, the forum of the INTOSAI Working Group on the Evaluation of Public Policies and Programmes took place in Bern in October 2025 under the title “Making a Difference Through Data”. The aim of the forum was to discuss how data analysis can be embedded in the practice of SAIs and how it contributes to making performance audits and evaluations more effective.

Creating a Culture of Data Analysis in a SAI

A survey conducted among WGEPPP members and observers showed that data analysis is already part of audit work in many SAIs. It is used to analyse large amounts of data, highlight trends and identify differences between regions, institutions or population groups. Accessible applications such as data visualisations, digital surveys and descriptive analyses are particularly common. However, although data analytics is being used more widely, it is not yet systematically embedded in most SAIs. While some institutions have made it a strategic priority, many still apply it on a case-by-case basis. Only a minority of auditors are actively involved in data analysis, and specialised data units remain rare.

This underlines the need to build and sustain a data-driven culture within SAIs. Such a transformation is not merely a technical exercise. It requires lasting changes in behaviour and must become part of everyday audit work. The Swedish National Audit Office illustrated this point through an approach built around four mutually reinforcing elements: 1. skills, 2. processes and organisational design, 3. methods and use cases, and 4. infrastructure. Developed together, these elements provided the basis for long-term organisational change.

In the early stages, progress depended on clear leadership and decisive choices. Over time, the focus shifted towards experimentation, iterative learning and the creation of spaces where new approaches could be tested, such as an innovation lab. A clear purpose was also essential. Framing data analytics to translate technology into societal value helped reduce resistance and encouraged staff to take part in the transformation.

In practical terms, this requires SAIs to define clear objectives for the use of data analytics and to translate them into staff development and audit planning. This includes identifying the skills required, whether in a dedicated data unit or within existing audit teams. It also means assessing current capabilities and identifying auditors who can benefit from targeted training. Professional development plans can then help staff build relevant skills in a structured way. Finally, audit assignments should be organised so that staff can apply and strengthen these skills in practice. The Swiss Federal Audit Office has also developed a tool to assess the level of data analytics culture within an SAI, based on a comparative survey of auditors.

This leads to a key lesson from the forum. If SAIs wish to make sustainable use of data analysis, they must develop it as a core component of their working model. It is not enough to support individual projects with data analysis. Auditors themselves also need to build data analytics skills, so that they can identify relevant analytical opportunities, work effectively with data specialists and integrate data-based evidence into their audit judgement.

Integrating Data Analysis Throughout

Data analysis should be considered at two distinct stages of the audit or evaluation cycle. The first stage is audit programming, before the annual programme is finalised. At this point, SAIs should assess the potential for data analysis in relation to the topic under consideration and the data that may be accessible from the audited entity or from other sources. This early assessment helps to determine whether data analysis can add value, what type of skills are required and whether data analysts should be involved in the audit team from the outset.

The second stage is the preparation of the audit or evaluation itself. At this point, the audit questions involving data analysis need to be specified more precisely. The audit team should then assess whether the necessary data exist, whether they can be accessed and whether their quality is sufficient for the intended analysis. Where such data are not available, the team should consider whether they can be collected in a proportionate and reliable way within the audit. This helps ensure that data analysis is not added as an afterthought but is properly integrated into the audit design.

Added Value Stems from Clear Audit Questions

A key finding of the forum was that data analysis does not derive its value from the technical complexity of the method or the volume of available data. The added value is realised above all when it is closely linked to clear audit questions. Data analyses can directly answer important evaluation questions or back up qualitative findings. They can also help to present the context of an audit finding in a more comprehensible way. It follows that data analysis almost never stands alone. It delivers the greatest added value in combination with other methods, such as interviews, case studies or document analyses. For SAIs, this is a particularly important insight. Data does not replace the professional judgement of auditors. It broadens the basis for that judgement and can help to better justify conclusions.

The forum also demonstrated that data analysis is particularly valuable where traditional audit approaches reach their limits. It can reveal patterns that are difficult to identify in individual case audits. It can capture target groups more accurately and highlight discrepancies between policy objectives and actual outcomes. Data analysis becomes a tool that goes beyond description. It can help to identify problems more precisely and provide better justification for recommendations. The added value therefore lies not in more data, but in a strict analytical approach to the audit work.

Data Analytics for More Impactful Audit Reports

Another key topic was how data analysis contributes to the impact of audits. The answer is not always immediate. Data-driven audits rarely lead directly to visible improvements. Their impact is often indirect. They highlight problems and improve the evidence base for recommendations. This is precisely where their practical value lies. When SAIs can demonstrate where programmes are failing to reach their target groups or where resources are not being used effectively, they create a stronger foundation for improvements. The same applies when data gaps prevent appropriate management. Data analysis thus not only helps to make audit reports more precise. It can also help to ensure that recommendations become more concrete, verifiable and more useful for public administration and decision-makers.

Two additional factors make data analysis particularly relevant for SAIs. First, audited entities may not always have the resources, expertise or incentives to analyse their own data in a systematic way. By demonstrating the added value of data analysis, SAIs can encourage them to make better use of the information they already hold and to strengthen evidence-based policy management. Second, important data is often spread across different agencies. The horizontal perspective of SAIs enables them to connect, compare and cross-reference data from different sources, which can reveal patterns and insights that would otherwise remain hidden.

The WGEPPP Forum 2025 demonstrated that data analysis does not automatically improve performance audits and evaluations. It only realises the benefits when it is planned at an early stage, applied methodologically appropriately and combined with other sources of evidence. Equally important is that it is supported organisationally and remains linked to professional audit judgement. The central message of the forum is therefore that data analysis is a tool that can help SAIs to ask better questions, understand complex public programmes more accurately and formulate more effective recommendations. Innovation in performance audits therefore does not simply mean using new tools. It means bringing together data, methods, people and institutional learning in such a way that audits become more relevant, evidence-based and effective.



INTOSAI

Working Group on Evaluation of Public Policies and Programs (WGEPPP)

Source: INTOSAI Working Group on Evaluation of Public Policies and Programs (WGEPPP)



Renewable energy turbine windmills in Espel, Netherlands. Source: Adobe Stock Images, Fokke Baarssen

Using AI and Data Analysis in a Performance Audit to Determine Overlap Between Energy Efficiency Policies

Authors: Jaap Ligthart, Eline Lampers, Bing Steup, Marcus van Toor, Berrie Zielman, Netherlands Court of Audit[1]

Energy Efficiency Policies in the Netherlands

At the beginning of 2026, the Netherlands Court of Audit published a report on the use of taxpayers' money to fund both voluntary and obligatory energy saving measures. To carry out the audit we relied heavily on AI to analyse the data and map the overlap between incentives and obligatory measures. In this article we explain how we approached the audit topic and the use we made of AI.

The cleanest form of energy, is energy that is never used. To this end, the Netherlands imposed an obligation on companies and non-profits that use more than 50,000 kWh of electricity and/or 25,000 m^3 of natural gas per annum to invest in energy saving measures (energiebesparingsplicht). These businesses are obliged to take every energy saving measure that can be recouped within 5 years. Although this is a national policy, the Dutch government uses it to adhere to article 8 of the EU's Energy Efficiency Directive on obligatory energy savings. The policy also supports Sustainable Development Goal 7 on renewable energy and energy efficiency.

In addition to this obligation, the government has introduced at least 17 grant schemes, tax schemes and other policy instruments to encourage companies and non-profits to invest in voluntary energy efficiency measures. These schemes range from direct financial incentives to tax breaks and free CO2 trading allowances. The government spent about €1.2 billion on these schemes in 2024, versus €15 million to enforce the energy saving obligation.

Given that both the incentives and the obligation are intended to encourage companies and non-profits to invest in energy saving measures, there is a risk of overlap. This could lead to the government paying companies to invest in energy saving measures they are already obliged to take, which would be an inefficient use of taxpayers' money.

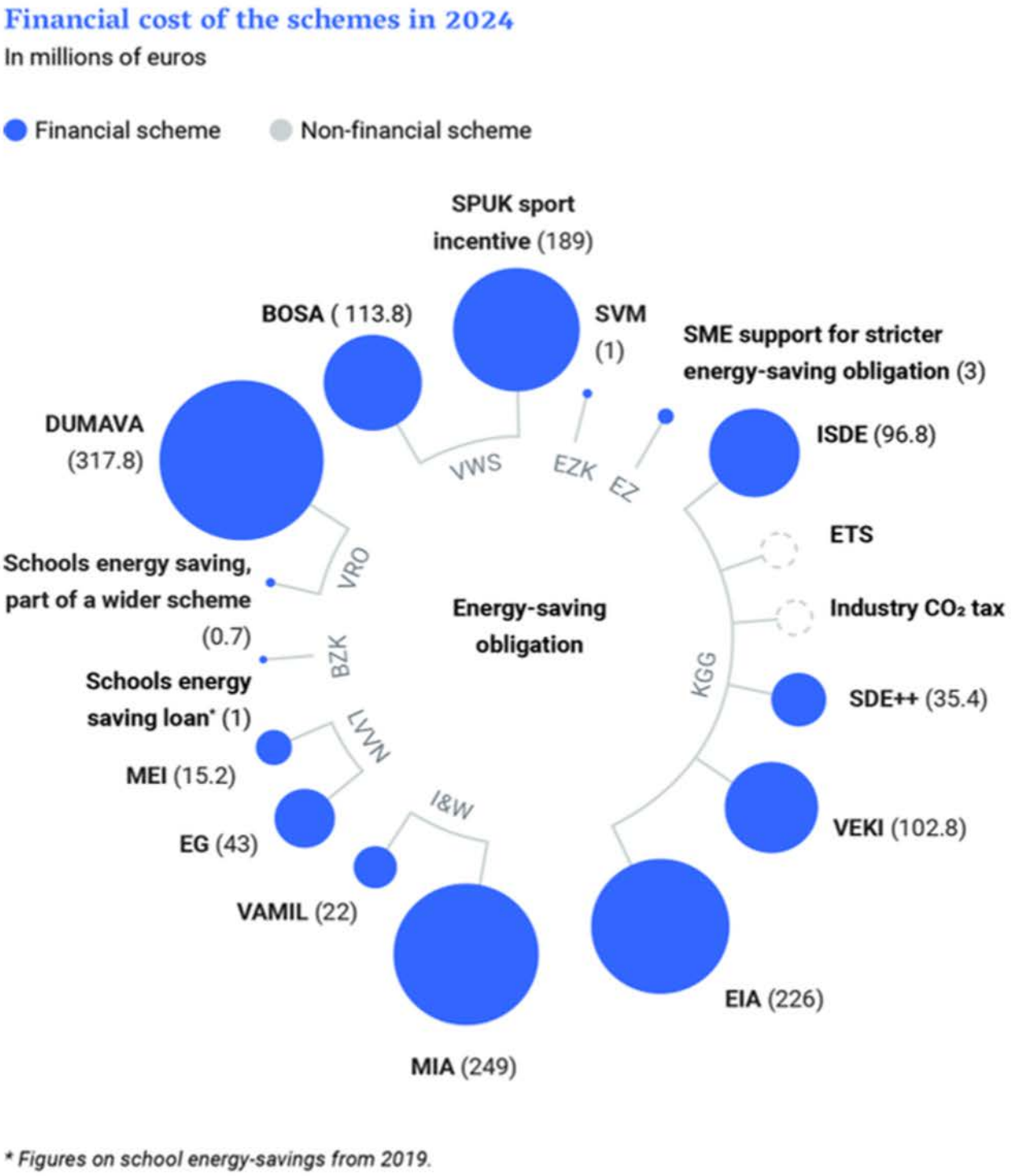


Figure 1: The cost of the 17 financial incentives versus the energy saving obligation. Source: Netherlands Court of Audit

Audit Objectives

The audit objectives were to determine whether there was an overlap between the incentive schemes on the one hand and the energy saving obligation on the other in the period 2019-2024, and to determine the financial size of this potential overlap. Analysing overlap among the incentives themselves was not part of the audit. Given the number of policies, the number of grants and the number of obligatory and voluntary energy saving measures, we used AI and data analysis to complete this performance audit. We carried out our audit in 2024-2025, with the core of the AI analysis being performed in June-July 2024 using the tools available at the time. The audit was published in January 2026.[2]

Using AI and Data Analysis

To determine the overlap between the incentives and the obligatory energy saving measures we had to determine:

1. whether there was an overlap between the incentives and the obligatory measures (supported by AI);
2. how much money had been spent on measures that were also obligatory (data analysis);
3. what proportion of that money had been received by companies and non-profits that were already obliged to take energy saving measures (data analysis).

Step 1: Matching Policies

The first step was to determine which measures in the 17 incentive schemes were obligatory. To do so, we used lists of obligatory measures and incentive measures. The government publishes a list of obligatory energy efficiency measures (Erkende Maatregelenlijst, or EML). This list contains hundreds of measures, broken down by healthcare, sport accommodations, industry, etc. Almost all companies subject to the obligation use the list to meet the obligation, although some exemptions are made. The list is updated every 4 years. Many of the incentive schemes had their own lists. These lists change every year and can contain hundreds of measures.

Most measures, on both the EML and the incentive lists, are explained in one or more pages of text describing the intended use, technical specifications, economic specifications, energy efficiency requirements, et cetera. Comparing the lists, for the period under review (2019-2024), would have been very time-consuming if done by hand. We therefore we used AI.

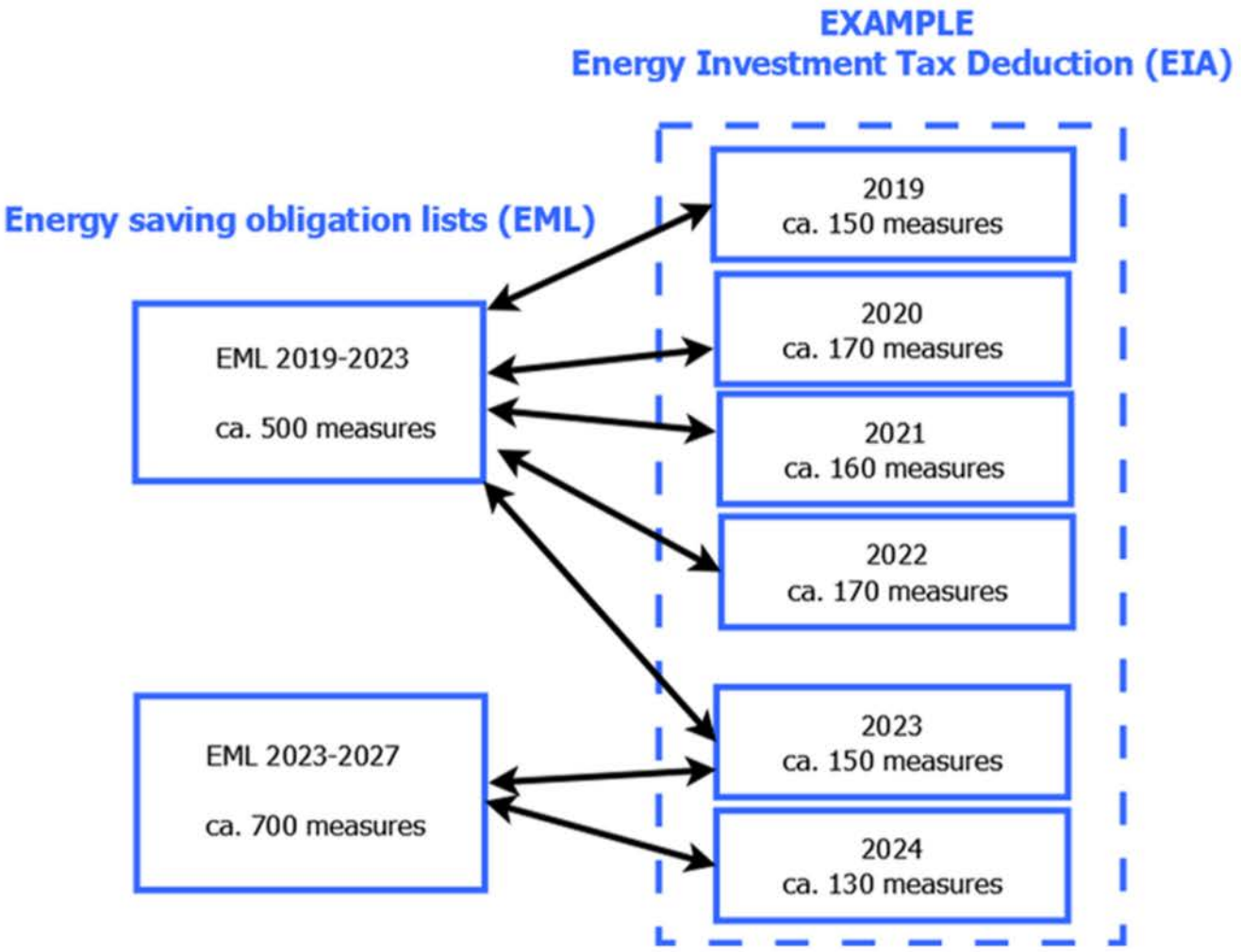


Figure 2 Model to match obligatory and voluntary energy saving measures. Source: Netherlands Court of Audit

The first stage of any data analysis or AI project is to prepare and clean the data. In our case, the source files (i.e. the lists containing obligatory and voluntary energy saving measures) contained unstructured data (PDF files), and each policy used its own formatting conventions. The files describing the measures accordingly had to be converted into a usable structure for the AI, i.e. text files, using a unique parser. This approach is not scalable; it requires a different approach to each incentive and each year. We therefore limited the initial phase of our analysis to two relatively straightforward files and compared the EML with the EIA list for a particular year with respect to 1 category (e.g. metal industry).

After preprocessing, the data was submitted to OpenAI's GPT-4o model. In essence, we provided the model with subsets of obligatory energy saving measures, for example 10 of the circa 500 EML 2019 measures. We then asked the AI to identify measures in a grant scheme that matched the descriptions of obligatory EML measures. During review, the team observed both accurate matches and clear false positives and negatives. Our analysis missed matches but also concluded that some obligatory measures did not actually match with grant schemes. A consistent issue was the model's difficulty in interpreting what it meant to 'match the perceived goal'. For example, EIA grants support ventilation to distribute warm air equally around a room. AI matched the EIA grants with an EML measure that also involved ventilation, but with the goal of removing polluted air. The AI likely matched it because the term 'ventilation' was used in both the EIA and the EML. However, the use of the technology was different.

Effective AI analysis relies heavily on the quality and specificity of the context. The broad spectrum of incentive schemes introduced substantial noise and unnecessary, irrelevant text. To address this, we added a step where the AI first filtered the voluntary measures based on their semantic relevance to each obligatory energy saving measure (for more information, see https://en.wikipedia.org/wiki/Semantic_search). Although this yielded better results, the improvements were marginal. Refining the prompts, the instructions we gave to the AI model, produced better results, but it became evident that we were approaching a performance ceiling. In the end, we refined the prompt to the one presented in figure 3, where we learned to specifically ask for structured output. Even after all these steps, the model could not consistently determine whether an incentive scheme was genuinely relevant to a particular obligatory measure. However, based on the rough findings (and manual checks), we identified 8 schemes which likely overlapped with the obligation.

```
[
  {
    role: "system",
    content: `Write in the style of a specialised journalist for an interested but not expert public
You will receive a list of obligatory energy saving measures in the following format:


Serial number: <Serial number>
Activity: <Activity>
Description: <Description>
Techniques: <Techniques>
General explanation: <General explanation>

You will then receive a document with incentive measures. Each incentive is intended for a particular goal.

Determine which incentives also appear on the list of obligatory energy saving measures. The description of the obligatory energy saving measure must agree with the intended use of an incentive. Return all results.

Give your answer in the following format:

Incentive code: <Incentive code>
Incentive description: <Incentive description>
Incentive intended for: <Incentive intended for>
Serial number: <Serial number>
Energy saving measure activity: <Energy saving measure activity>
Energy saving measure description: <Energy saving measure description>
Energy saving measure techniques: <Energy saving measure techniques>`,
  },
  { role: "user", content: "<eml prompt>" },

  { role: "user", content: "<energy list>" },
];

```

Figure 3: Prompt used to match obligatory energy efficiency measures and incentives. Source: Netherlands Court of Audit

Step 2: Matching the Cost of Incentives and the Cost of Obligatory Measures

Based on the matches found in step 1, in step 2 we used data from the ministries concerned to determine what part of the policy costs was spent on energy efficiency incentives that were actually obligatory (figure 4). This was not possible for 4 of the schemes due to poor data quality or for other reasons. We ended up with 4 schemes where the financial overlap could be quantified. The overlap ranged from €5.2 million in 2019 to a maximum of €51.4 million in 2023 (falling to €44.3 million in 2024). This is the absolute maximum of inefficiently used tax money identified in this audit.

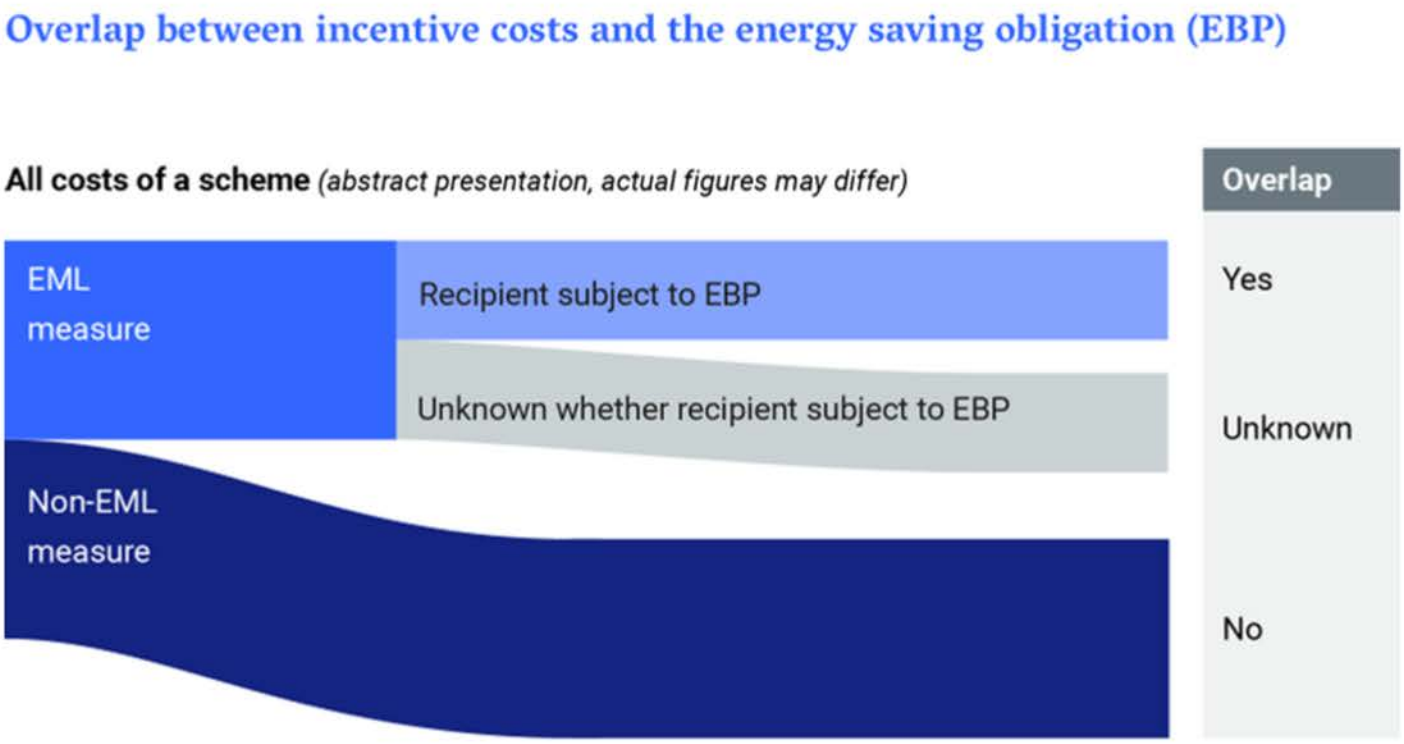


Figure 4: Model to determine the overlap between incentives and obligatory measures. Source: Netherlands Court of Audit

Step 3: Incentives Paid to Companies and Non-profits Subject to Obligatory Measures

In our third and final step, we determined which of the energy efficiency incentives (established in step 2) were paid to companies subject to the national energy efficiency obligation. This proved difficult; the responsible ministry did not know which companies were obliged to take energy saving measures. Companies and non-profits have to report their obligation to take energy saving measures to local authorities, but only about 45% of the ca. 100,000 that are likely subject to the obligation actually do so. We matched their reports to the recipients of energy saving incentives. This produced an overlap of between €0.7 million (2019) and €9.5 million (2023). This is the absolute minimum financial overlap between the incentive measures and the energy efficiency obligation.

Results

The results of using AI and data analysis in this performance audit are twofold. On the one hand, this new audit method enabled is to answer our audit question: via grants and tax schemes, taxpayers' money was spent on obligatory energy efficiency measures. Some of this money was used to support companies and non-profits subject to the energy efficiency obligation. However, compared to the total cost of the 17 energy efficiency incentives, €1.2 billion in 2024 alone, the inefficiency is relatively small (figure 5). This is the result of the respective ministries actively trying to prevent their supplementary policies from overlapping with the energy efficiency obligation.

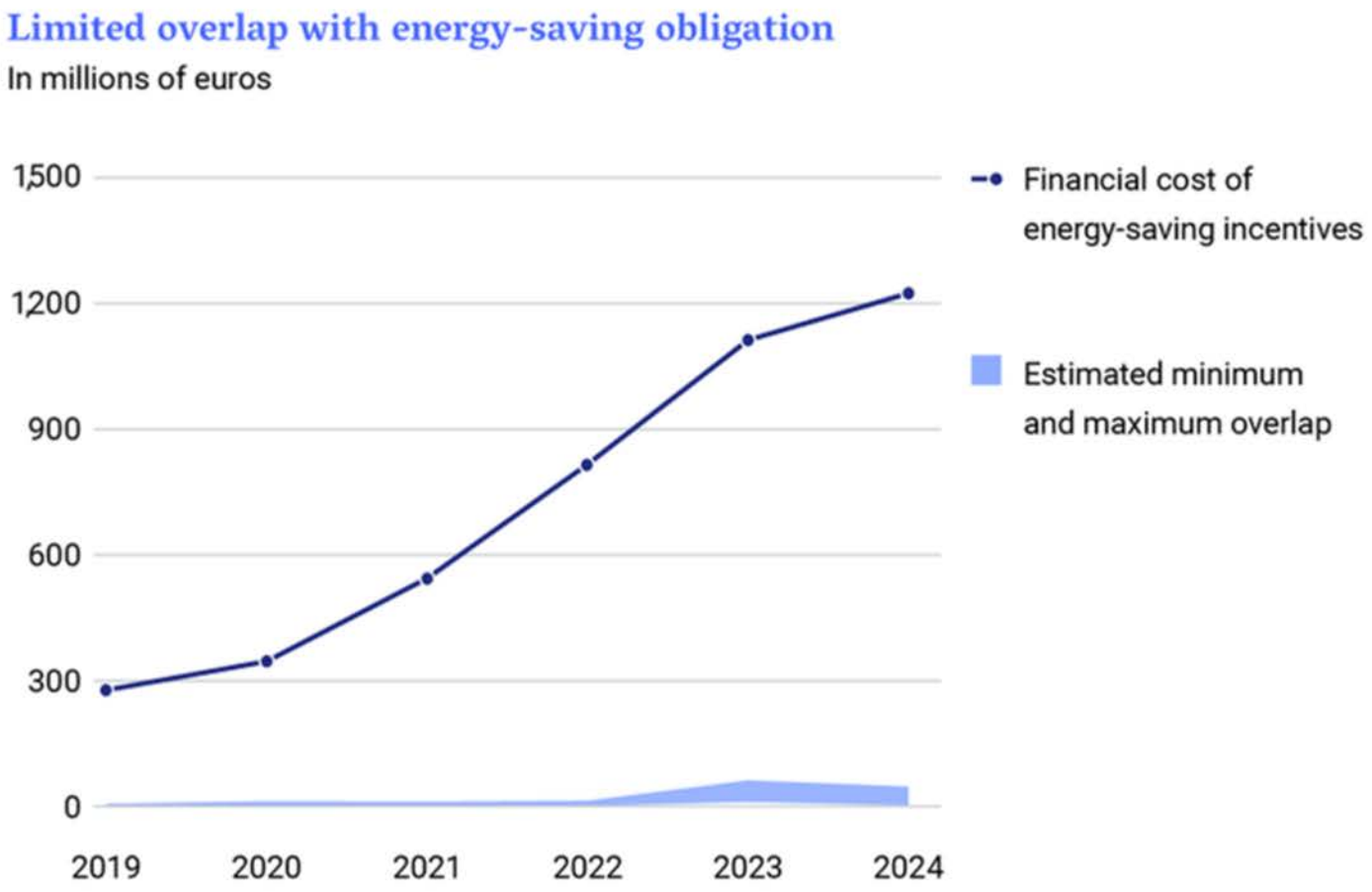


Figure 5: Overlapping costs relative to the overall cost of energy saving incentives. Source: Netherlands Court of Audit

On the other hand, this new method taught us about the use of AI in audit. It turned out to be challenging for a large language model (LLM) to consistently match the incentives with the obligatory measures. This could be due to the fact that the main quality of an LLM lies in generating texts and not in accuracy, especially when it comes to numbers. More importantly, running the same model with the same values results in different responses, making it impossible to reproduce the results. This represents a challenge, especially for audit institutions. In the end, the AI output was a good starting point but a thorough manual check remained necessary.

In retrospect, several aspects of our approach could have been improved. Even after data cleansing to improve comparability, too much noise remained, resulting in the need for manual inspection of the model's results. A more effective strategy would have been to evaluate each obligation/incentive pair individually and request a relevance score accompanied by an explanation, rather than a binary decision. Additionally, our initial question was overly broad and provided little guidance for the model to come up with useful suggestions of matches. Large language models are generalists and we should have provided more explicit definitions and examples of what we meant by 'matching the measures'. All these extra steps increase the time investment needed to make this approach a success. Despite these limitations, the exercise was highly valuable; it provided a starting point for our final analysis. It enabled the team to clarify its requirements and created a platform for future AI analysis projects at the Netherlands Court of Audit.

AI models have improved since our initial analysis. Current models may therefore be able to perform the tasks needed for our audit objectives. If other SAIs are intending to use AI in future audits, or have already done so, we would like to hear from them.

Footnotes

1. Jaap Ligthart: project lead and auditor. Eline Lampers: data expert and auditor. Bing Steup: AI expert. Marcus van Toor: auditor. Berrie Zielman: data expert. ↩
2. https://english.rekenkamer.nl/latest/news/2026/01/15/very-limited-overlap-between-energy-saving-obligation-and-financial-incentives



Aftermath of the 2024 flood in Alfafar, Valencia, Spain. Source: Adobe Stock Images, Altseason

Open Data and AI-Driven Geospatial Analysis: Scaling Risk Assessment of Post-Flood Emergency Grants to the Full Population

Author: Joaquín Izquierdo Peris, Audit Senior, Sindicatura de Comptes de la Comunitat Valenciana (Regional Audit Institution, Valencia, Spain)

Abstract

On 29 October 2024, a DANA — a Spanish acronym for an isolated upper-level atmospheric depression forming over the Mediterranean Sea — triggered catastrophic flash flooding across Valencia province, Spain. Within hours, several municipalities received severe rainfall equivalent to an entire year's precipitation, with peaks of up to 771 litres per square metre, devastating entire towns, leaving thousands stranded, damaging over 60,000 dwellings, destroying more than 130,000 vehicles, and claiming 230 lives.

Within weeks, the Regional Government deployed a comprehensive post-disaster aid framework exceeding 2,000 million euros as of March 2026, including a direct grant programme ("Aid for essential household goods") to compensate affected households for the loss of essential items in their primary dwelling. To examine all 27,282 applications under such a concession model, the Regional Audit Institution of Valencia designed an automated methodology integrating open data, geospatial analysis, Python scripting, and artificial intelligence (AI)-assisted drafting — enabling individual-level assessment without recourse to sampling.



Figure 1. Valencia DANA 2024: Key Figures. Source: Sindicatura de Comptes de la Comunitat Valenciana.

1. Background and Audit Mandate

Following the DANA flooding of October 2024, the deadliest natural disaster in Spain in recent history, the Regional Government issued direct grants of up to 9,000 euros to owners and tenants of affected dwellings to compensate for the loss of household appliances and other essential domestic items. Grants were conceded without prior assessment, solely on the basis of a responsible declaration signed by the applicant attesting that essential household items at their primary residence had been damaged as a result of the flooding — a design that placed the full evidentiary burden on the applicant and created a high-risk scenario from a control perspective, precisely of the type that INTOSAI's GUID 5330[1] identifies as characteristic of post-disaster aid contexts.

The Sindicatura de Comptes de la Comunitat Valenciana[2], has undertaken a special audit report combining compliance and performance approaches to assess whether the aid reached its intended purposes.

The audit frames a central analytical question: to what extent do the geographic characteristics of the primary dwelling declared by each applicant provide objective, publicly verifiable indicators consistent or inconsistent with the programme's essential eligibility condition — that essential household items at that address had in fact been damaged because of the flooding event?

The spatial audit procedure described in this article identified a substantial number of funded applications presenting geographic indicators inconsistent with the programme's eligibility condition, which the granting entity will need to subject to individual documentary review to determine whether the declared damage can be substantiated. The audit team discussed these preliminary findings with responsible personnel of the granting entity. The complete and final report on the audit of aid related to the DANA was published on 15 September 2026, and is available on the Sindicatura de Comptes website (in Spanish)[3].

2. Beyond Sampling: a Full-Population Audit Approach

Prior to the development of the automated pipeline, the spatial verification of a funded application required the auditor to manually query each cadastral reference, a comprehensive recording of real estate or real property's boundaries, through the Valencian Government's cartographic viewer[4], cross-referencing the location of the declared property against the official DANA flood footprint layer, and simultaneously consulting the Cadastre Electronic Register for the property's descriptive and constructive data. This manual procedure — illustrated in Figure 1 — is accurate and reliable for individual case review, but its sequential, one-by-one nature renders it wholly impractical at the scale of 27,282 applications: assuming a conservative estimate of five minutes per case, full-population coverage would require over 2,200 hours of auditor time.

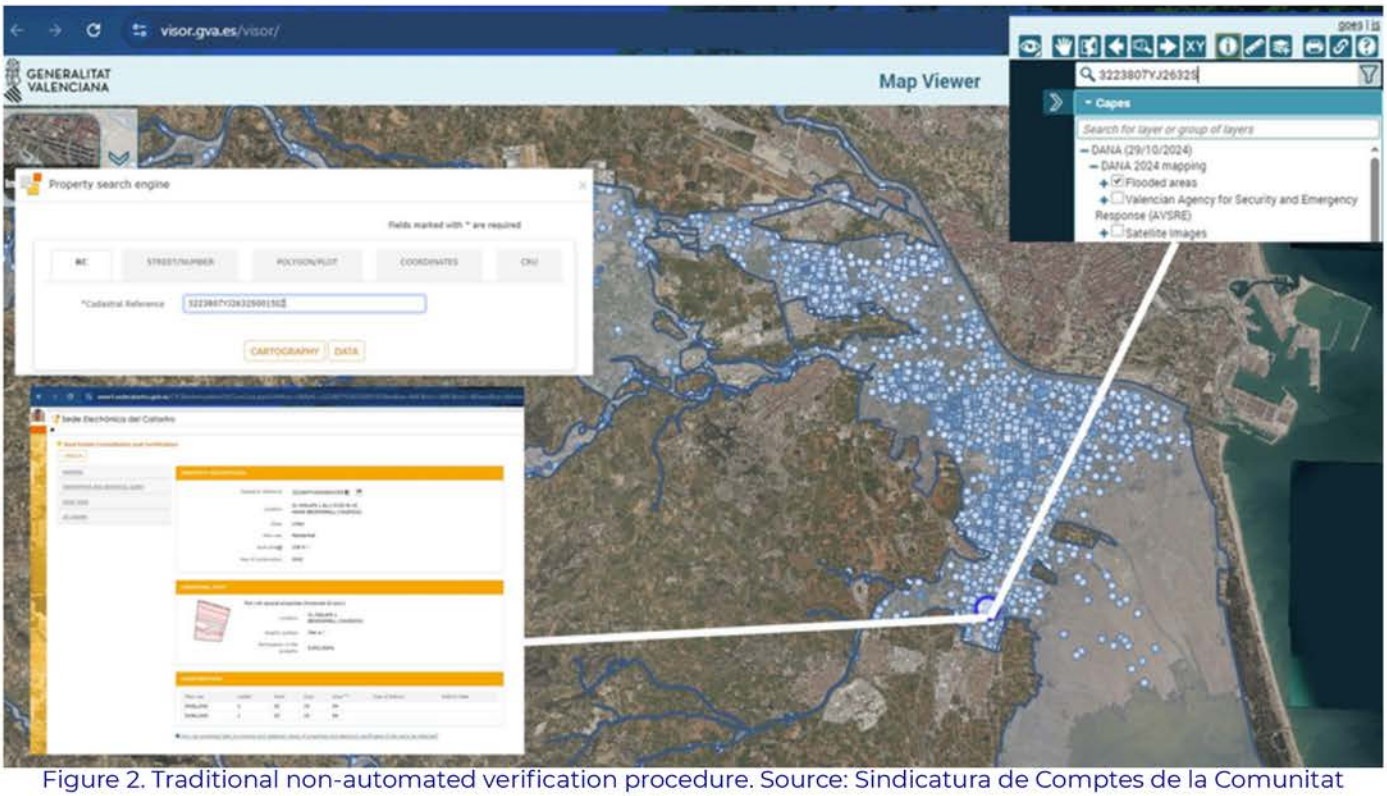


Figure 2. Traditional non-automated verification procedure. Source: Sindicatura de Comptes de la Comunitat Valenciana.

Conventional audit practice would have restricted spatial analysis to a stratified sample — typically 200 to 400 cases — with findings extrapolated statistically. The availability of complete, machine-readable public datasets fundamentally altered the cost-benefit calculus of this choice.

The availability of both mentioned datasets was a necessary but not sufficient condition: transforming them into a population-level audit procedure required a Geographic Information System (GIS)-based analytical environment, Python scripting to automate the processing of 27,282 records, and AI-assisted drafting to support the iterative development of the analytical pipeline.

The flood footprint[5] is a georeferenced vector layer delineating the area affected by surface water inundation on 29 October 2024, produced by the Valencian Cartographic Institute (ICV/GVA) through the processing of satellite imagery and aerial photography captured in the immediate aftermath of the event, and published as open data.

The Cadastre Electronic Register[6] of the Directorate-General of Cadastre (Spanish central government) provides free public access to cadastral data. Available resources include alphanumeric property records and vector parcel cartography downloadable by province, as well as web services for individual and bulk queries of non-protected cadastral attributes — including use classification, floor-level data, and built surface area — for every registered property.

The audit procedure described in the following section does not purport to establish the presence or absence of damage in individual cases; rather, it constitutes a GIS-based data analytics procedure consistent with the risk-based approach recommended in GUID 5330, generating objective, publicly verifiable audit leads for prioritised documentary follow-up.

3. Methodological Procedure

Using QGIS$_Z$ and its embedded Python console, the audit team built a suite of automated scripts that processed the full 27,282-record population end-to-end across seven sequential stages.

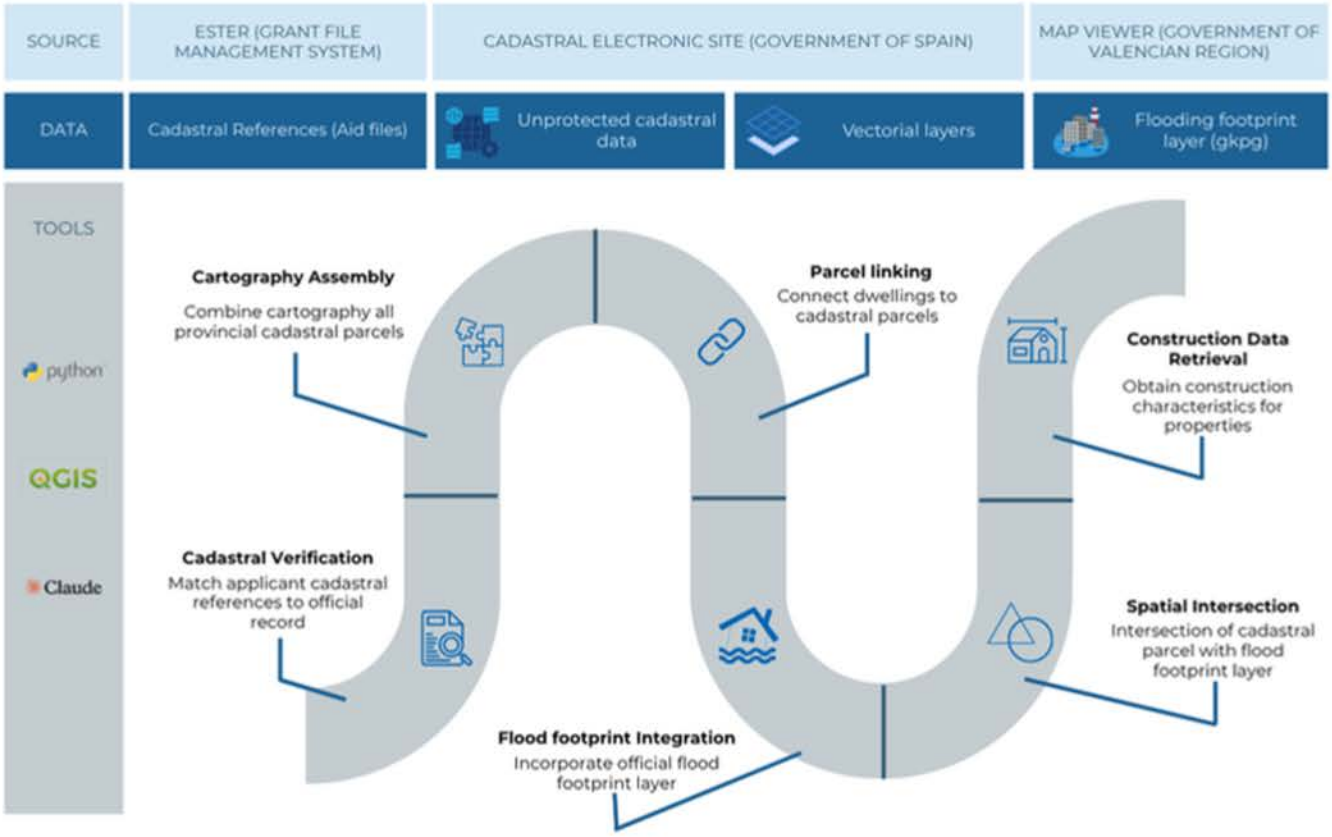


Figure 3. Methodological procedure. Source: Sindicatura de Comptes de la Comunitat Valenciana.

The first stage verified whether each cadastral reference declared by the applicant corresponded to a property registered in the Directorate-General of Cadastre, querying the Cadastre's public data web service for all 27,282 references. The script configured a two-second pause between queries to prevent server-side throttling, with automatic detection of blocked responses and up to three retry attempts per reference.

The second stage assembled the provincial cadastral cartography. The script downloaded parcel geometries for the entire province of Valencia from the Cadastre Electronic Register, aggregated them into a single layer across all 266 municipalities, and applied geometry repair. The resulting layer comprises over 1.7 million georeferenced parcels.

The third stage linked each granted dwelling — identified by its cadastral reference — to the geometry of its corresponding cadastral parcel. The script implemented a one-to-many join to avoid data loss in multi-property buildings, where multiple cadastral references share a single parcel identifier.

The fourth stage incorporated the official flood footprint layer published by the Valencian Cartographic Institute (ICV/GVA). The script loaded the layer and applied geometry repair prior to use in the spatial analysis.

The fifth and central stage performed the spatial intersection analysis. For each application, the script assessed whether the cadastral parcel polygon intersected the flood footprint polygon; any spatial overlap, however small, resulted in classification as inside the footprint. In keeping with a conservative methodological approach, the script generated a 200-metre buffer around the perimeter of the footprint to identify a proximate zone, classifying parcels within this band separately from those clearly beyond it.

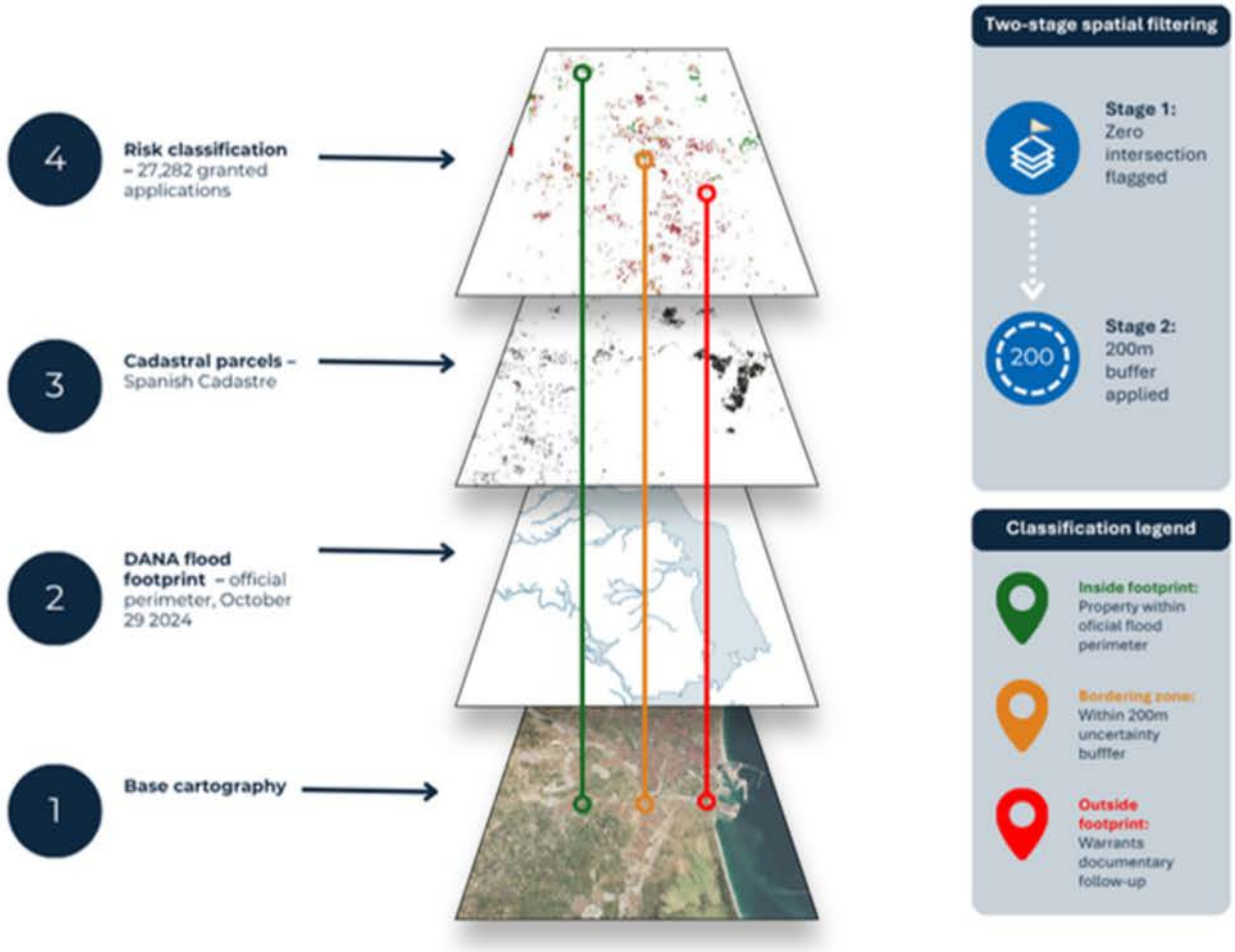


Figure 4. GIS layer overlay analysis. Source: Sindicatura de Comptes de la Comunitat Valenciana.

The sixth stage retrieved construction characteristics — use classification, floor code, and built surface area — for each declared property through automated queries to the Cadastre web service.

A final consolidation stage assembled all results into a master table and produced the georeferenced output layer with three-tier colour classification — green for parcels inside the flood perimeter, orange for the proximate zone, and red for parcels located more than two hundred metres outside.

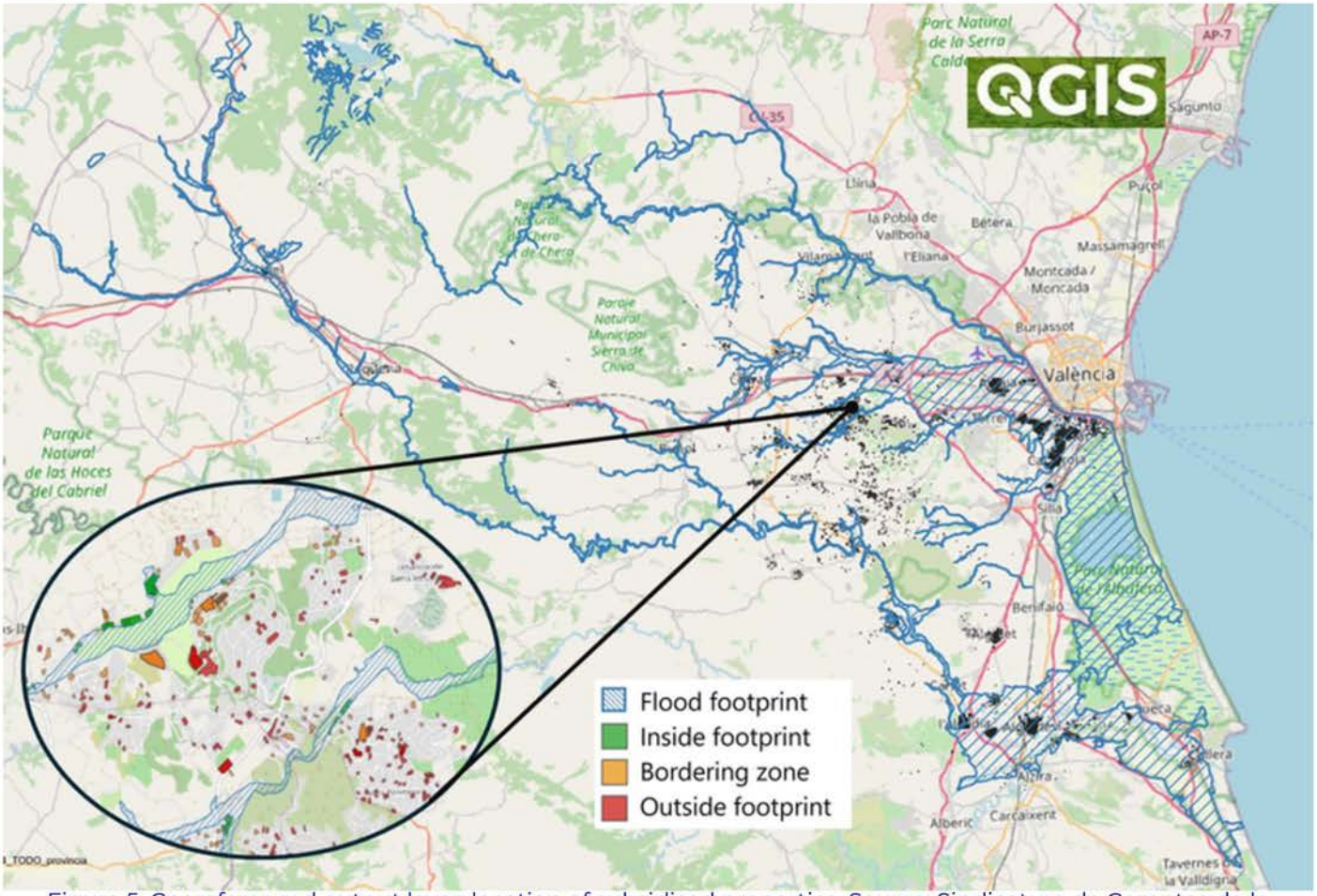


Figure 5. Georeferenced output layer: location of subsidised properties. Source: Sindicatura de Comptes de la Comunitat Valenciana, obtained from QGIS.

4. Open Data, Automation, and AI-Assisted Drafting

The entire analytical chain relied on publicly available datasets — the flood perimeter and the national cadastral registry — both open government sources subject to no access restrictions and freely replicable by any third party with access to the same public data, without requiring specialised data infrastructure.

Python scripting within QGIS's embedded interpreter automated the full pipeline from raw input files to risk-classified output tables and cartographic layers, with no manual data manipulation at any intermediate stage. The audit team used an AI large language model (Claude, Anthropic) under a documented internal procedure to support iterative script drafting, troubleshooting of automated scripts, methodological note preparation, and report text structuring.

The AI's contribution was strictly assistive and subject to review at each iteration: the audit team performed all methodological decisions, threshold calibration, data validation, and findings interpretation exclusively.

5. Implications for Public Audit Practice

This case demonstrates that open geodata, GIS automation, and AI-assisted drafting can transform audit evidence from sample-based inference to population-level fact-finding — even under the resource constraints typical of regional audit institutions. The key enabling factors were not exceptional technology budgets but the availability of structured public datasets and the willingness to invest in bespoke scripting as an audit procedure.

Three design principles proved transferable beyond this case: conservative spatial thresholds protect findings from overreaching the probatory value of geodata; transparent, versioned analytical code creates an auditable trail that can be reviewed and updated without rerunning the full analysis; and framing location as a risk indicator — rather than a definitive criterion — preserves the proportionality required by INTOSAI standards. Any SAI with access to open cadastral and hazard-perimeter data can replicate this approach for natural disaster grants, flood relief, post-earthquake reconstruction, or wildfire recovery funds using open-source GIS tools at no additional cost.

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Footnotes

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7. QGIS is an open-source Geographic Information System (GIS) application that enables the loading of geographic data, the overlaying of spatial data layers, the measurement and intersection of geometries, and the visualisation of results on a cartographic base. Available at https://qgis.org/ ↩

Note: The author utilized AI assistance in developing formatting concepts for Figures 3 and 4, but the final figures are not AI generated.



Auditors from the State Audit Office of Viet Nam. Source: State Audit Office of Viet Nam

Innovation in Performance Auditing to Enhance Transparency, Good Governance, and Anti-Corruption at the State Audit Office of Viet Nam

Author: State Audit Office of Vietnam

I. Introduction

At present, countries around the world are facing significant pressure to strengthen public governance, achieve the United Nations Sustainable Development Goals, and fulfill commitments to preventing and combating corruption, wastefulness, and other negative practices. In this context, Sustainable Development Goal 16 highlights the importance of enhancing transparency, good governance, and combating corruption in all its forms. At the same time, the Abu Dhabi Declaration of the International Organization of Supreme Audit Institutions (INTOSAI) also emphasizes and reinforces the role of Supreme Audit Institutions (SAIs) in preventing and combating corruption more effectively.

As an active member of INTOSAI, the State Audit Office of Viet Nam (SAV) has continuously made efforts to strengthen anti-corruption work through audits of major thematic areas relating to the management and administration of the state budget and issues susceptible to irregularities, corruption, and wastefulness, while promoting the application of new tools, techniques, and audit methodologies in this field.

II. Performance Audit and Its Role in Public Governance and Anti-Corruption

According to INTOSAI's ISSAI 3000, performance audits assess the economy, efficiency, and effectiveness (3Es) of public programs, policies, projects, and activities. The relationship between performance audit, public governance, and anti-corruption is reflected in the following aspects:

First, compared with compliance and financial audits, the selection of potential performance audit topics involves a more comprehensive process, including the development of topic selection criteria, audit programs and audit plans, the assessment of potential impacts, and the formulation of anticipated recommendations from the outset of the audit. The selection of appropriate audit topics, thorough preliminary surveys, and detailed audit planning help identify unusual signs, gaps in power control mechanisms, and deficiencies in internal control systems, thereby enabling the early identification of risks of corruption and waste within audited entities.

Second, performance audit serves as a tool for enhancing transparency through the disclosure of results and the effectiveness of the management and use of public finance and public assets by organizations and budgetary levels. Performance audit is an important component in supporting public authorities responsible for the management and use of public finance and public assets in enhancing accountability, strengthening integrity, and reinforcing public trust. It also provides a basis for oversight and scrutiny by the National Assembly, People's Councils at all levels, members of the National Assembly, People's Council delegates, state agencies, socio-political organizations, and citizens over the management and use of public finance and public assets, thereby reducing the risks of corruption and wastefulness.

Third, performance audit contributes to improving public policies by providing independent, objective, and evidence-based assessments of policy implementation processes as well as policy results and performance. Beyond identifying deficiencies or wastefulness, performance audit helps reveal shortcomings in policy objective setting, resource allocation mechanisms, performance measurement systems, inter-agency coordination processes, and the extent to which intended objectives have been achieved. On that basis, it identifies gaps in institutional and policy frameworks and recommends corrective actions, thereby assisting public authorities in adjusting, amending, or replacing outdated or inappropriate regulations. Therefore, performance audit serves as an important policy feedback mechanism, contributing to improved public decision-making and promoting public governance that is transparent, effective, and results-oriented.

III. New Tools and Approaches in Performance Auditing

1. Full-Population Auditing

In the context of the Fourth Industrial Revolution, the application of technology and digital transformation has become an urgent requirement for the SAV. For performance auditing, this innovation has facilitated a shift from traditional audit approaches based on sampling and manual testing to a comprehensive audit model based on digital data and AI applications. This approach addresses the limitations and risks of traditional audit methods that rely on the assessment of internal control systems and sampling techniques, which examine only a portion of available data. The application of big data analytics tools enables auditors to examine and analyze entire datasets, thereby enhancing the ability to detect errors, fraud, and corrupt practices. However, this approach requires investment in and further development of databases and information technology applications to collect, store, and analyze information relevant to audit topics. To date, SAV has developed an audit knowledge management software application based on a database of audit findings and detected deficiencies in the local budget sector. We have also built a database covering the period 2023–2025 from 180 audits, comprising approximately 10,700 audit findings and deficiencies identified from 2,097 audited entities across 34 provinces and centrally governed cities. The software is capable of extracting and classifying data from audit reports through the integration of artificial intelligence and optical character recognition (OCR) technologies. It also provides multidimensional analytical dashboards, semantic search functions, and support for auditors in identifying similar findings and recommendations for reference purposes.

2. Innovations in Analytical Techniques and Performance Audit Methodologies

Analytical techniques and approaches in performance auditing have also undergone significant innovation, with the objective of not only making audits faster but also conducting audits in a smarter, deeper, and more impactful manner for public governance. Key innovations include:

Application of pattern, trend, and data analysis techniques

The SAV has introduced and operated the Centralized Audit Management System (AMS), electronic audit logs, and specialized data analytics software. By 2025, SAV's data repository contained more than 100 million records, and six artificial intelligence (AI)-based software applications had been deployed to analyze operational patterns and trends of audited entities. These applications support budget monitoring, risk assessment, financial transaction review, public investment oversight, and green expenditure assessment, enabling the system to scan entire datasets and predict trends of irregularities and fraud, thereby allowing the audit institution to intervene at an early stage. At the same time, AI adoption is expected to be transformative, enabling SAV to gradually shift toward intelligent and proactive oversight of the management and use of public finance and public assets across ministries, sectors, local governments, agencies, and public entities.

The emergence of AI and big data analytics technologies also enhances objectivity, reduces subjective bias, and generates valuable policy recommendations. AI can further forecast trends of irregularities and fraud, enabling audit institutions to take early action rather than responding after incidents have already occurred.

Innovation in Audit Methodologies

Technology can only deliver its full value when applied within an appropriate audit approach. Innovation in performance auditing is not merely the digitalization of traditional audit processes; rather, it involves transforming the way audit evidence is collected based on audit criteria and relevant data analysis, shifting from a focus solely on assessing the 3Es to analyzing root causes and evaluating performance from a system-wide perspective.

Specifically: (i) A valuable audit result should not merely determine "whether a program has achieved its objectives"; it should also explain "whether the program was designed with appropriate objectives", "whether the input data were reliable", "whether coordination mechanisms and resource allocation criteria were reasonable", and "whether implementation capacity and oversight mechanisms were capable of identifying risks"; (ii) A system-oriented approach does not simply examine the results of the 3E assessment in isolation; it requires analysis of the system as a whole and evaluation of the entire operational mechanism that produces those results. Auditors should focus on factors such as governance arrangements, allocation of responsibilities, internal control systems, decision-making processes, data quality, inter-agency coordination, and monitoring and feedback mechanisms.

IV. Conclusion

Innovation in performance auditing is an inevitable requirement to meet the growing demands for transparency, good governance, and the prevention and combating of corruption, wastefulness, and other negative practices. Through the selection of appropriate audit topics and the application of data analytics, artificial intelligence, and innovative audit approaches, Performance auditing can not only be conducted more efficiently but also in a smarter, deeper, and more impactful manner for public governance. In the years ahead, the combination of modern technologies, big data, and auditors' professional judgment will provide an important foundation for the State Audit Office of Viet Nam to further enhance audit quality, contribute to improving public policies, strengthen public trust, and prevent corruption, wastefulness, and other negative practices at an early stage and from afar.



Source: Adobe Stock Images, ZETHA_WORK

Transformation In Performance Audits: The Comptroller and Auditor General of India's Technology Driven Audit Innovation

Author: Comptroller and Auditor General of India

Introduction

The expanding complexity of digital governance has fundamentally reshaped the audit landscape. Supreme Audit Institutions (SAIs) today confront voluminous financial records, and rapidly evolving programme architectures that strain conventional audit methods. Sample based scrutiny, and conventional data analysis methodologies are increasingly inadequate to detect systemic risks, hidden relationships, and governance failures embedded within interconnected digital systems.

The Comptroller and Auditor General of India is responding to this challenge through a structured technology driven audit innovation. Over recent years, our institution has integrated advanced analytical capabilities spanning network analysis, machine learning, optical character recognition (OCR), and AI-powered image analytics into its performance audit processes.

Case Study 1: Performance Audit of Welfare Schemes

India's social protection architecture encompasses dozens of overlapping welfare programmes, from food security and housing to health insurance and rural employment, each maintaining independent beneficiary databases. While digital delivery through Direct Benefit Transfers (DBT) has substantially improved transparency, it has also created new challenges like exclusion of eligible households, silent duplication of benefits, and fragmented coverage across schemes. Conventional audits examined schemes in isolation, making cross-scheme systemic analysis almost impossible.

SAI India is conducting a data driven Beneficiary Schemes Audit covering seven major welfare schemes in seven States of India. The overall public expenditure involved in the seven schemes during 2023-24 was ₹4.14 billion. The audit adopted a household-centric, integrated analytical framework, treating beneficiary records across all seven schemes as interconnected nodes within a unified graph model. The combined size of the databases across all seven schemes is approximately 800 TB, wherein around 140 TB of data has been identified as relevant and required for the audit. Aadhaar[1] hash values served as anonymised linkage identifiers, enabling the mapping of household-level benefit convergence and exclusion patterns without compromising privacy.

The analytical workflow encompassed dataset extraction and standardisation, cross-scheme household mapping, graph modelling and linked-entity analysis, anomaly detection, and risk-based prioritisation for field verification. The drone based validation to verify housing scheme records under the Pradhan Mantri Awas Yojana (PMAY, or an affordable housing mission by the Government of India) in selected locations revealed mismatch between stage of construction of house and release of funds.

Using big data analysis of the full population, we observed that approximately 3.6 million families remained excluded from benefits under major welfare schemes despite qualifying as eligible target households, a finding impossible to surface through conventional sampling and data analysis methods. This also highlighted the need for systemic reforms in targeting mechanisms and inter-scheme coordination, demonstrating how integrated analytics can deliver evidence based insights into welfare delivery effectiveness and equitable benefit reach.

Case Study 2: "Artifacial Intelligence" — AI Powered Image Analytics tool

Beneficiary verification in welfare audits has traditionally relied on structured data fields to detect anomalies. Yet a significant dimension of beneficiary identity has remained entirely unaudited i.e., the photographs stored alongside database records in virtually every major welfare scheme. Visual fraud like reused photographs enabling multiple registrations, blank or non-human images, group photographs obscuring individual identity represents a systematic vulnerability that structured data analysis cannot detect.

The Centre for Data Management and Analytics (CDMA) of SAI India has developed an AI based Image analytics toolkit called "Artifacial Intelligence" using open source Python libraries for image based beneficiary verification. This tool enables detection of duplicate images using perceptual hashing, flagging identical photographs used across multiple registrations with a 100% match threshold to minimise false positives, error image detection, identifying files with valid image extensions that contain no actual image data, face detection and count analysis.

Built on OpenCV, dlib, and face_recognition libraries with a PyQt6 graphical interface, the application requires no coding knowledge, runs on standard desktops, and produces outputs as structured CSV files or organised image directories. A Sankey[2] diagram summarises analytics results visually for audit reporting.

The tool processed 238,000 photographs linked to 119,000 beneficiaries during a performance audit. Systemic flaws in the scheme's IT infrastructure like image duplication and invalid entries that could have enabled misuse of welfare funds. The findings directly informed audit observations and policy recommendations for strengthening photo validation controls in welfare scheme IT systems.

Case Study 3: e-Procurement Audits through Machine Learning Algorithm

Public procurement remains one of the highest-risk domains for governance failures. Collusive bidding, cartelization, bid rotation, cover bidding, and the use of proxy vendors are persistent risks that conventional procurement audits struggle to identify. Tender-by-tender scrutiny, however thorough, cannot reveal the network-level patterns that characterise systemic collusion.

SAI India developed a relationship centric network analytics framework for e-procurement audits, integrating three complementary analytical techniques. The Graph-based Network Analysis modelled as interconnected nodes and edges, enabling visualisation of dense bidder clusters, dominant vendor networks, and anomalous procurement relationships at scale. Pattern Detection using Apriori Algorithm[3] to identify recurring bidder combinations across multiple procurement events.

Entity Resolution using fuzzy matching (which is a technique that is used to identify and link strings of data that may not be an exact match, but are likely to represent the same entity) where vendor names, addresses, and registration details were cross matched to detect duplicate vendor identities and concealed relationships between apparently independent bidders.

The framework was built entirely on open-source technologies like R programming and Python[4] libraries ensuring both scalability and cost effectiveness. The methodology enabled full population analysis of procurement behaviour, detecting hidden vendor connections, collusive bidding patterns, and flag systemic risks invisible to conventional review. We also built institutional analytical capacity through standardised workflow templates, reducing the technical barrier for subsequent audit teams.

Case Study 4: OCR and AI-Assisted Document Analysis

A defining characteristic of public audit in large governance systems is the sheer volume of unstructured documentary evidence like scanned certificates, handwritten passbooks, invoices, assessment orders, etc. Manual scrutiny of this evidence is time-consuming, error-prone, and inherently limited in coverage.

SAI India deployed the Optical Character Recognition (OCR) technique across two distinct audit streams. It was deployed for welfare and document integrity audits which integrates bilingual OCR (Hindi and English) with Natural Language Processing (NLP) and computer vision to extract and analyse text from beneficiary certificates, passbooks, and related documents. A forensic layer detects tampering indicators like whitener marks, altered records, duplicate photographs and an audit fusion layer synthesises textual and visual evidence into explainable, AI-assisted audit conclusions. Similarly, in direct tax and financial statement audits, OCR extracts structured data from tax audit reports, invoices, computation sheets, and financial statements in PDF or scanned form. The extracted data is standardised, cross-verified across source documents, and analysed for anomalies and inconsistencies. Specific checks including invoice cut-off testing, cross verification between income tax returns and tax audit reports etc. are performed.

This has significantly reduced manual scrutiny workload, accelerated evidence processing, improved fraud indicator detection, and expanded audit coverage.

Practical Pathways for SAIs: Getting Started with Audit Innovation

SAI India's experience across these four initiatives offers actionable lessons. The first stage is diagnostic and foundational where SAIs may begin by assessing the availability, quality, and accessibility of digital data held by audited entities. SAIs should conduct an honest assessment of in house analytical capacity: the skills available, the tools already in use, and the gaps that need bridging.

The second stage involves targeted experimentation. Rather than attempting institution wide transformation at once, SAIs are better served by identifying a specific audit area where digital data is available and the audit question is well-defined.

The third stage is methodological consolidation. Successful pilots must be codified into reusable frameworks: documented workflows, standardised scripts, audit templates, and quality assurance protocols that allow subsequent teams to replicate and adapt the methodology without rebuilding it from scratch. This is the stage at which innovation transitions from individual expertise to institutional capability.

The fourth and most critical stage is capacity and culture. SAIs must invest in structured training programmes that develop analytical literacy across audit cadres. This does not mean turning every auditor into a data scientist, but to ensure that analytical tools are understood, trusted, and used with professional judgement.

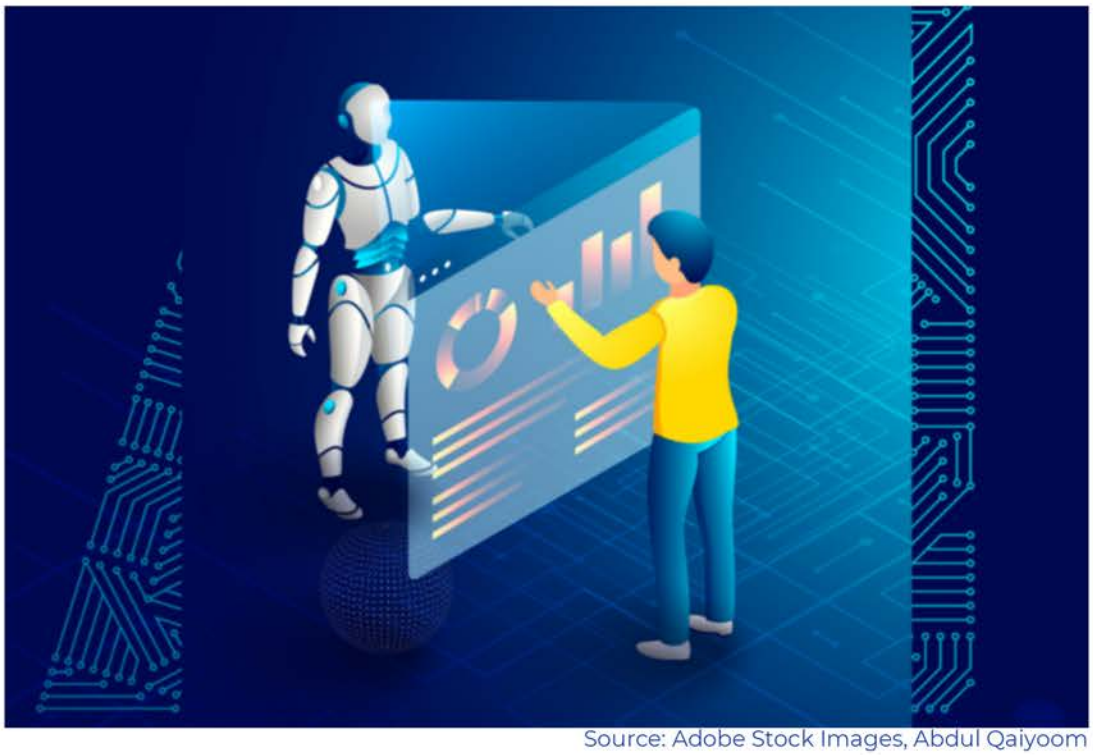
Conclusion

The digital transformation of governance systems demands a corresponding transformation in public sector auditing. SAI India's experience demonstrates that emerging technologies like drones, image analytics, AI/ machine learning (ML) techniques can collectively shift audit capability from reactive transaction testing toward proactive, intelligence driven oversight.

As governance systems grow more complex and digitally interconnected, the SAIs that will deliver the greatest public value are those that invest today in the tools, techniques, and institutional culture required for tomorrow's audit challenges. The transformation has begun, the imperative now is to accelerate and share it.

Footnotes

1. Aadhar number is the unique 12-digit identification number issued to residents of India. ↩
2. A Sankey diagram is a visual flow chart where the width of the arrows is directly proportional to the flow rate or quantity of data. ↩
3. Unsupervised Machine Learning algorithm ↩
4. Python libraries including NetworkX, igraph, and tidygraph ↩



Source: Adobe Stock Images, Abdul Qaiyoom

Preparing for a Digital Audit Workforce – Lessons Learned from Applying Agentic AI at the Swiss Federal Audit Office

Authors: Orlando Willig, (orlando.willig@efk.admin.ch) and Marco Schreyer, Swiss Federal Audit Office (SFAO), Bern, Switzerland (marco.schreyer@efk.admin.ch)

1. A Technological Shift for Public Audits

The integration of artificial intelligence (AI) in the public-sector has reached a point at which Supreme Audit Institutions (SAIs) can no longer treat it as a distant or experimental matter. Emerging applications of agentic AI are beginning to reshape the work of professional knowledge services, including auditing. The pace of this development, driven both by private-sector commercial adoption and by the rapid evolution of open technical standards, makes technology relevant for public auditing today rather than at some point in the future.

Recent signals from the private sector illustrate the scale of the shift: the "Big Four" accounting firms estimate that AI agents will contribute between 20 and 30 percent of a typical financial audit by 2029[1]. While SAIs operate under fundamentally different mandates, the underlying technological curve is a shared one – and a redistribution of this magnitude would substantially reshape the composition of audit work.

This article draws on early experiences of the Swiss Federal Audit Office (SFAO) in deploying agentic AI in audit contexts, including performance audits. It identifies considerations that warrant institutional attention regardless of current technical maturity, and it sketches the direction in which the underlying architecture is evolving. Its central proposition is that SAIs cannot understand agentic AI from the outside. Practical engagement – through small, well-scoped projects under appropriate data protection and governance arrangements – is the surest way to build the institutional knowledge required to use the technology responsibly and on the SAI's own terms.

2. From Chatbot to Agent: A Structural Shift

The distinction between generative and agentic artificial intelligence is structural, not merely gradual. Where generative AI responds to prompts, *agentic* systems operate autonomously toward defined goals over extended periods – combining tool use, memory, and planning to decompose complex tasks, access external data sources, and refine their outputs based on intermediate results. For performance auditing, this shift is particularly significant: performance audits are inherently iterative, multi-source, and judgment-based. Requiring the kind of cross-system retrieval and evidence synthesis that agentic architectures are specifically designed to handle (see Figure 1).

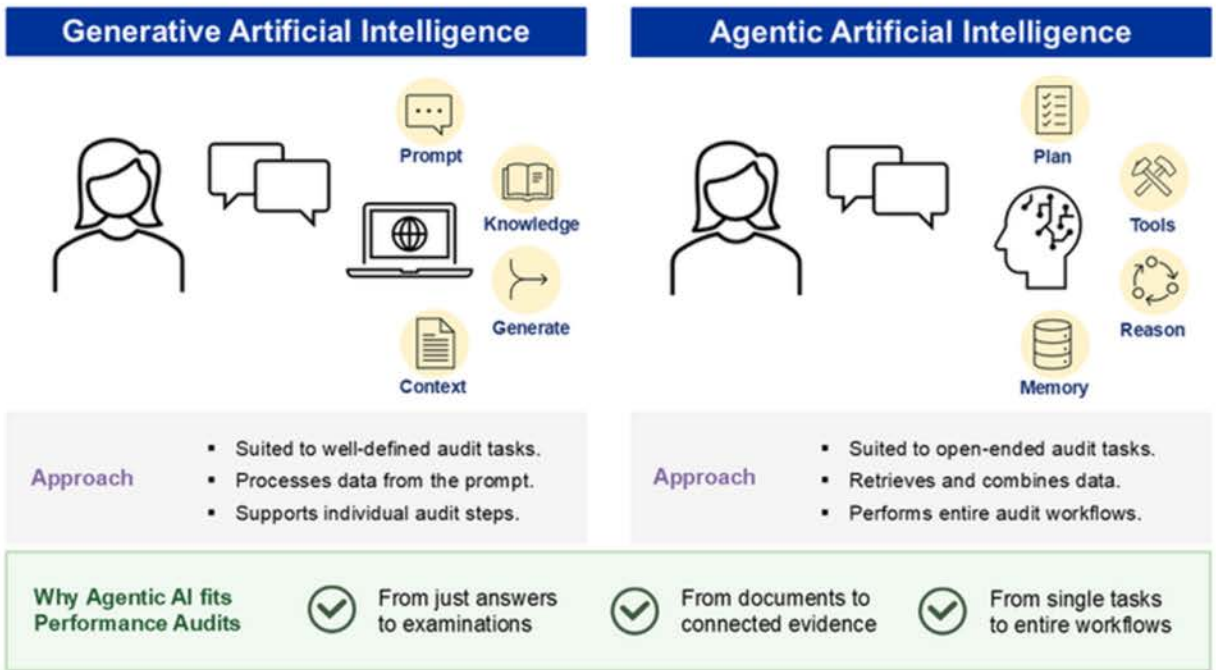


Figure 1: Generative versus agentic AI: Architecture of an AI audit agent combining tool use, memory, and planning.
Source: Swiss Federal Audit Office (SFAO)

3. Early Experiences at the Swiss Federal Audit Office

At the SFAO, early work with agentic AI has focused on concrete audit situations rather than abstract experimentation. The aim has been to understand how agents perform when applied to core audit tasks: preparing interviews, reviewing reports, comparing information, and structuring findings. Three strands are particularly instructive: interview preparation, quality assurance of audit reports, and multi-agent collaboration in audit workflows (see also figure 2).

3.1 Agentic AI for Interview Preparation

A first prototype focused on supporting preparation for a follow-up meeting on an audit mandate. Using an agentic setup connected to an audit database and a set of case documents, the agent reviewed materials across both sources, compared information from different parts of the audit file, identified inconsistencies, and produced a structured interview guide with specific points for clarification and follow-up. The prototype demonstrated the value of agentic AI for focused synthesis across heterogeneous audit materials. A task that would typically require several hours of manual review could be completed in minutes, while the auditor remained responsible for assessing relevance, accuracy, and tone. The lesson was not that the agent could replace audit preparation, but that it could accelerate retrieval, comparison, and structuring in support of human professional judgment.

3.2 Agentic AI for Audit Report Quality Assurance

A second prototype focuses on the quality assurance of audit reports. It supports the human final review of report drafts through a structured, AI-assisted workflow from preliminary review to final approval. The system checks language, structure, consistency, and editorial quality against defined review stages, SFAO-specific drafting guidelines, and applicable federal guidelines. The prototype illustrates how agentic AI can contribute to a part of audit work that is essential but time-consuming and often unevenly documented. By comparing the original text with proposed revisions and documenting review steps, applied rules, open points, and approval status, it creates greater transparency in the quality-assurance process. The lesson is that agentic AI can help apply institutional standards more consistently, provided that human reviewers retain responsibility for accepting, rejecting, or adapting proposed changes.

3.3 Agentic AI for Multi-Agent Audit Workflows

A third prototype explored how agentic AI can be structured not only as a single system but also as a team of collaborating agents. In this proof of concept, three agents were deployed in sequence, each assuming a distinct audit role: an Auditor agent to identify and extract relevant entities from a source document, an IT Auditor agent to screen those entities against an external reference database, and a Lead Auditor agent to synthesize the findings into a structured audit report. The prototype demonstrated that a division of labor between agents can mirror the division of responsibility within a human audit team. No single agent performed the full task; each built on the output of the previous one, creating handover points that can serve as checkpoints for human review.[10] The lesson was architectural: complex audit tasks may be decomposed into role-specific steps, making agentic workflows more transparent, governable, and compatible with human oversight.



Figure 2: Three agentic audit workflows involving AI agents designed by the SFAO. Source: Swiss Federal Audit Office (SFAO)

In parallel, agents have been tested at the SFAO on a range of internal tasks. The value of these experiments lies less in any individual output than in the breadth of hands-on exposure they provide – both for building institutional familiarity with the technology and for identifying where it adds value in practice.

4. Challenges and Considerations for SAIs

The experience described above raises a set of considerations that every SAI should examine before scaling agentic AI into routine practice. The transition from computer-assisted audit techniques (CAATs) to agentic AI introduces new forms of technical and organizational reliance: agents combine retrieval, validation, extraction, and analytical capabilities, and operate them with a degree of autonomy that earlier tools did not possess. Five interrelated challenges are particularly relevant.[11]

- Data quality: Reliable outputs depend on reliable inputs; SAIs therefore need complete, consistent, and machine-readable data before agentic systems can be used meaningfully.[12]

- Traceability and governance: Audit evidence must remain traceable, which requires logging of prompts, model versions, tool invocations, retrieved sources, intermediate outputs, and human review steps.[13] [14] [15] [16] [17]

- Competencies: Auditors will need to learn not only how to use agentic systems, but how to delegate tasks to them, question their outputs, and orchestrate agent-supported workflows.[18] [19]

- Institutional readiness: Effective deployment requires more than a technical pilot; it depends on infrastructure, data protection arrangements, specialized expertise, governance frameworks, and sustainable operational support.[20]

- Bias and impartiality: Because AI systems may reflect distortions in training data, source materials, or design choices, SAIs must embed human validation and professional skepticism into agent-supported audit work.[21] [22]

Taken together, these challenges do not argue against the use of agentic AI; they argue for its careful and deliberate implementation – one that is consistent with the institution's mandate, governance structures, and operational conditions.

5. Looking Ahead: Where Technology Is Going

"Audits are not dying yet, but they do need to adapt to the digital age," the International Accounting and Assurance Standards Board (IAASB) noted in its 2016 reflection on the future of audit. For SAIs, the rise of agentic AI gives this statement renewed practical significance. The challenges discussed above arise within an architecture that is itself still evolving, and three trends taking shape during 2026 will define the next phase of adoption (see also figure 3).

5.1 Agentic Audit Task Specialization

Current agentic AI deployments often still rely on a single agent, but the next step is likely to be greater task specialization. Dedicated agents for extraction, validation, norm comparison, drafting, and quality review can divide complex audit work into clearer and more governable steps. For SAIs, the lesson is that specialization can improve not only technical performance, but also transparency, responsibility, and human review.

5.2 Agentic Audit Task Routing

A second trend is the routing of audit tasks to the most appropriate AI agent. Complex reasoning may require more capable models, while parsing, classification, translation, or formatting may be handled by smaller or more specialized models. For SAIs, the lesson is that task routing can turn cost, data-sovereignty, and vendor-diversification requirements into deliberate architectural choices.

5.3 Agentic Audit Workforce

These architectural shifts point toward an audit workforce in which humans and agents operate in structured collaboration. Agents may increasingly support evidence gathering, standard comparisons, and initial drafting, while auditors focus on objectives, validation, stakeholder dialogue, and professional judgment. For SAIs, the lesson is that the central question is not whether agentic AI will replace auditors, but how auditors can use it responsibly and on their own terms.[23]

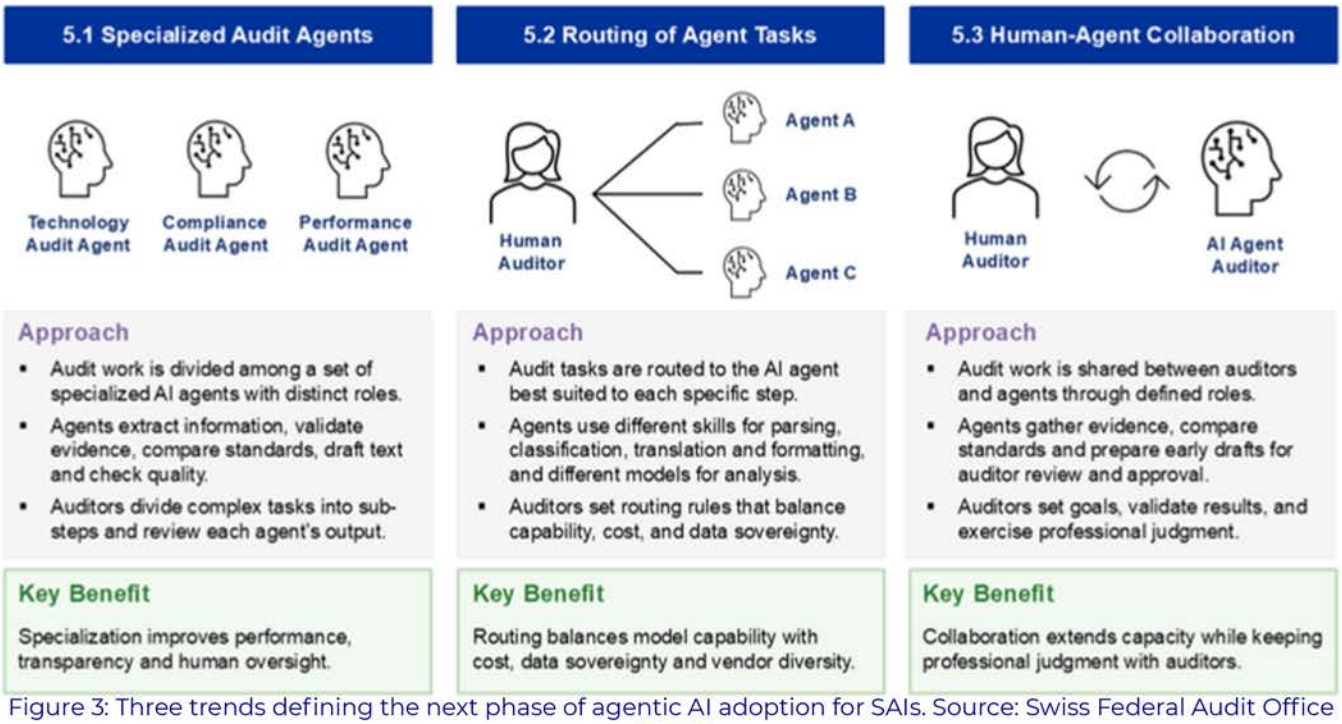


Figure 3: Three trends defining the next phase of agentic AI adoption for SAIs. Source: Swiss Federal Audit Office (SFAO)

Taken together, these trends suggest that the future of audit will not be defined by replacing auditors, but by redesigning how auditors and agents work together. The relevant question for each SAI is where, in relation to that trajectory, it chooses to position itself.

6. Conclusion

Agentic AI is moving fast from research prototype to operational practice. The SFAO's early experiments yield three lessons of broader relevance: practical engagement is the only reliable path to institutional understanding; small and well-scoped projects are a viable entry point whose value lies less in immediate output than in the institutional familiarity they build; and because the challenges agentic AI poses – around traceability, competencies, and oversight – are shared across SAIs, addressing them in isolation is inefficient (see figure 4).



Figure 4: Stages of responsible agentic AI adoption for SAIs. Source: Swiss Federal Audit Office (SFAO)

This last point argues for a structural response. A dedicated INTOSAI-level forum for the pragmatic exchange of experience on agentic AI would accelerate the collective learning curve of member institutions far more effectively than parallel isolated efforts. The opportunity to shape the role of this technology in public auditing from inside the profession itself is open at this moment, and acting upon it is a matter of institutional responsibility.

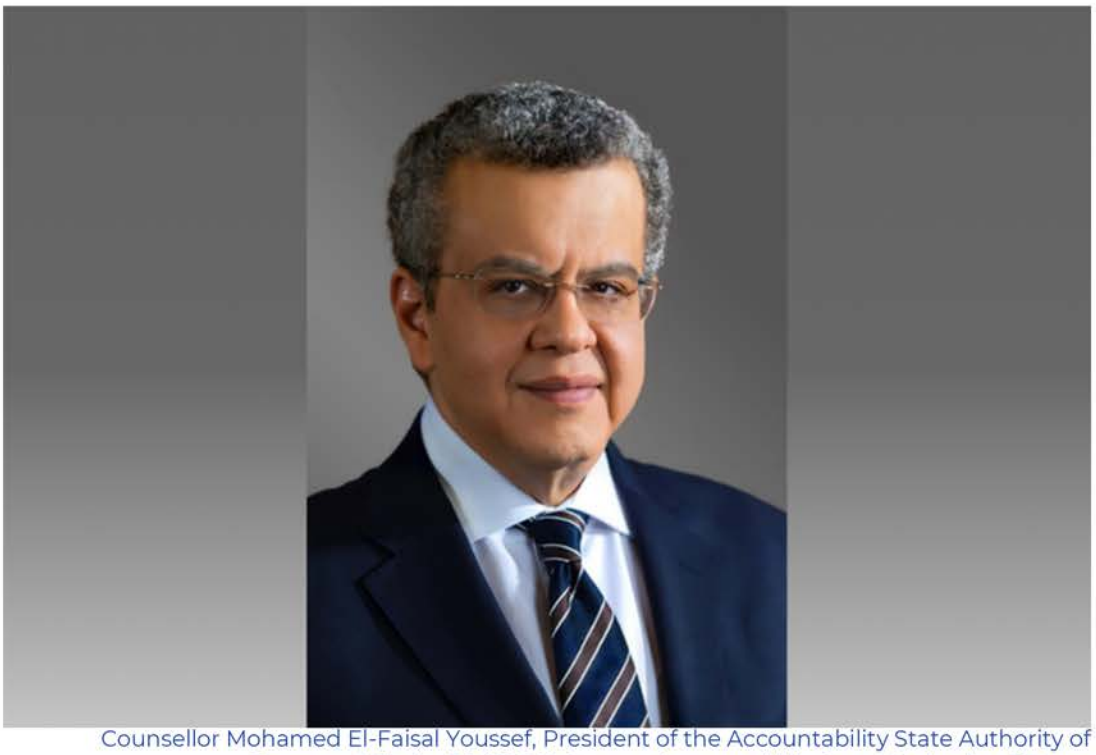
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Counsellor Mohamed El-Faisal Youssef, President of the Accountability State Authority of Egypt and Chair of INTOSAI. Source: Accountability State Authority of Egypt

Innovation in Performance Auditing Processes in Light of Modern Technologies

Author: Counsellor Mohamed El-Faisal Youssef, President of the Accountability State Authority of Egypt and Chair of INTOSAI

The field of auditing faces challenges in keeping pace with unprecedented changes in perspectives and tools brought about by contemporary technologies resulting from technological advancements and the growing reliance on artificial intelligence tools. The information technology environment is no longer merely an assisting vehicle to improve audit quality; rather, it has become the primary driver for redefining the concept of auditing, as affirmed by INTOSAI in its professional pronouncements, which advocate for the development of audit tools and methods to align professional practice with the digital environment.

This has prompted the Accountability State Authority (ASA), as the Organization's chair, to move swiftly in this direction by putting forward pioneering initiatives, such as the Maat Initiative, which was brought up to the 25th INCOSAI agenda in Sharm El-Sheikh in October 2025. This initiative represents a contemporary vision that reflects the importance of utilizing artificial intelligence in the development of audit work, particularly in terms of performance audits that focus on evaluating the performance of government entities to verify the efficiency of public spending, thereby supporting governance and the protection of public funds.

Integrating innovation into auditing processes in general, and into performance audits in particular, has become imperative given the changes in the auditing environment, particularly in light of contemporary technological advancements. The importance of this topic stems from the fact that it is one of the key auditing pillars upon which the work of the SAIs is based, and which is linked to the determinants of carrying out audit functions including performance audits in accordance with the relevant laws, regulations, standards, and guidelines of each country. The competence and technical expertise of auditors at the SAIs requires providing them with continuous training to keep up with rapid changes, with the aim of ensuring that performance audit results have a positive impact on the lives of citizens in society.

From this perspective, performance auditing is one of the areas most in need of methodological innovation, transcending traditional approaches, assessing the extent to which objectives are achieved according to criteria of economy, efficiency, and effectiveness to ensure a true measurement of performance that provides decision-makers with the necessary information on business outcomes. Therefore, focusing on innovation in performance auditing in light of contemporary technologies is crucial in driving this auditing transformation to ensure the sustainable improvement of audit quality. The topic will be addressed through three main axes:

The First Axis: Developing a Modern Approach to Performance Auditing in the Context of Contemporary Technologies:

Performance auditing is no longer limited to retrospective auditing. Owing to information technology, it has evolved into a proactive, real-time process based on a continuous flow of data. Among the most prominent technologies driving this transformation is big data analytics, which focuses on processing massive data streams and shifting toward the use of smart sampling in audits in line with a risk-based approach.

Artificial intelligence also represents a fundamental shift, with its technologies moving beyond merely detecting anomalies to predicting risks, thereby providing an opportunity for early corrective intervention, In addition, the Internet of Things (IoT) provides sensors in operational and logistical environments with accurate data on the efficiency of capital asset utilization and actual production rates, ensuring that performance audit reports are formulated based on unbiased digital evidence.

Therefore, applying this approach in the context of modern technologies requires the use of advanced software tools that integrate seamlessly into entities technological infrastructure, Among the most important of these are interactive data analytics platforms that provide interactive dashboards, enabling management and oversight levels to easily follow up and verify data. This helps extract findings from massive and complex datasets in a matter of seconds and detect anomalous patterns that may indicate poor performance or suspected corruption.

The Second Axis: The Shift towards Smart and Continuous Auditing:

The innovation-based radical shift importance lies in its impact on the auditing methodology, as this creates fundamental differences compared to traditional auditing, which requires adopting an appropriate strategy to each SAI to ensure a successful transition towards an innovative performance auditing environment.

2.1 Key Differences Between Traditional Auditing and Smart, Continuous Auditing:

An audit environment based on smart and continuous auditing brings about fundamental differences, including a shift to real-time and continuous auditing , by relying on the extraction of smart samples that truly represent the entire data population. Auditing also becomes proactive, predicting trends and risks, rather than merely tracking deviations after they occur. Furthermore, it relies on a source of evidence derived from integrated databases and the application of analytical models, rather than paper documents and files, thereby contributing to adding value to audit reports by including strategic recommendations to enhance efficiency and effectiveness.

2.2 An Integrated Strategy for an Innovative Performance Audit Environment:

SAIs and audited entities must adopt an integrated strategy to successfully transition to an innovative and smart performance audit environment. This strategy is based on four key elements:

- Establishing a governance and data architecture by investing in secure data repositories, ensuring the smooth flow of data between stakeholders, and focusing on data cleansing processes to guarantee the reliability of audit evidence.

- Developing the digital competence of auditors by providing ongoing training for audit personnel to enhance their data analysis skills, understanding the relationships between spreadsheets software, and professionally using intelligent assistants.

- Automating audit procedures by designing automated audit templates and forms that process data automatically to apply auditing standards and benchmarking tests without human intervention.

- Adhering to professional standards and cyber security, by verifying the compatibility of digital tools with international and local professional pronouncements in the field of auditing, and establishing strict protocols to protect the confidentiality and security of the data under audit.

The Third Axis: The Egyptian Experience in Improving Performance Auditing Processes:

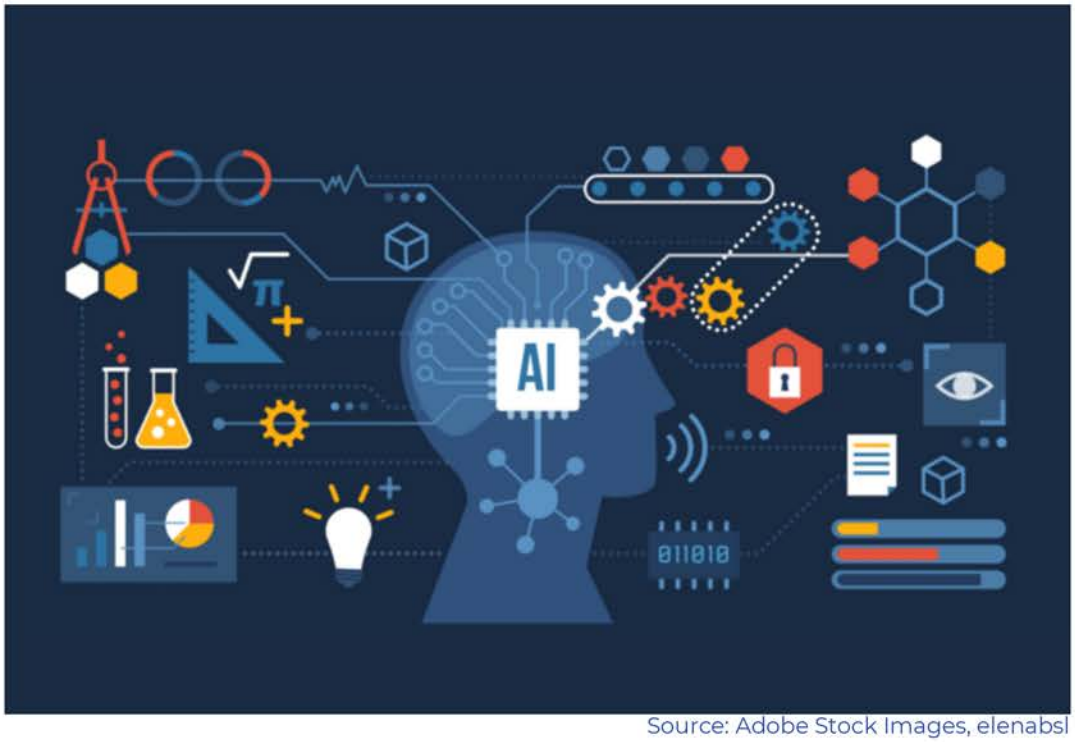
Egypt has harnessed its potential to provide government digital platforms, in line with its national strategy for sustainable development. This strategy is based on several pillars, including the auditing role played by the Accountability State Authority (ASA) as Egypt's SAI, given the information it provides that helps assess the extent to which the State's strategic objectives are being achieved.

Among these platforms are the Government Financial Management Information System (GFMIS), the Electronic Payment and Collection System (GPS), the Government Payroll Automation System (Payroll), and Single Window System (NAFEZA), as well as the establishment of the National Council for Artificial Intelligence and the launch of the National Artificial Intelligence Strategy, which included several objectives, such as building a robust infrastructure for artificial intelligence and ensuring data accessibility and sharing through the development of national data governance frameworks.

The ASA carries out its performance audit functions in accordance with relevant legislative provisions governing its audit activities. The ASA has signed cooperation protocols with the two Ministries of Finance and Communications regarding these platforms, which has been conducive to regulating the process of direct access for auditors to the financial reports produced by these government digital platforms. The ASA has also adopted performance audit standards and compliance audit standards in consistent with the International Standards of Supreme Audit Institutions (ISSAIs); This has led to a qualitative leap in the quality of the audit process, as auditors rely on original data directly from the actual operating environment of financial transactions, which has effectively impacted the quality of audit operations.

This improvement in the quality of the audit process is attributable to data integration, as the platforms provide a unified digital environment that serves as a consistent, centralized database, enabling comprehensive and interconnected tracking of operations; It enhances the reliability of this data, as well as supporting risk-based analysis, thereby increasing the accuracy of directing the auditor's efforts toward higher-risk audit samples, as a result of focusing on analytical activities supported by interactive dashboards that display performance and risk indicators simply and accurately, serving as a strategic tool that supports the creation of added value by enabling the issuance of early warnings regarding deviations, thereby enhancing the efficiency and effectiveness of performance audits through a shift toward proactive auditing , and the ability to detect deviations early and mitigate their effects, thereby enabling a shift from mere document auditing to an assessment of "economy, efficiency, and effectiveness"; It enables the ASA to accurately measure the extent to which government entities achieve strategic objectives at the lowest possible cost and with the highest quality, thereby contributing to increased efficiency in public spending and government performance, which improves the quality of public services and benefits citizens' lives.

Finally, we conclude how critical innovation is in performance audit processes under the contemporary technologies used by the SAIs, with shedding light on the lessons learned from the ASA's experience in this regard, particularly given its role as INTOSAI Chair, besides highlighting the Maat Initiative, serving as a forward-looking vision of the importance of artificial intelligence in advancing audit practices. Utilizing such technologies has become an imperative for enhancing the quality of performance audits and mitigating related risks, thereby contributing to improving the efficiency of public spending and achieving the strategic objectives of countries. This can be attained through the judicious leverage of contemporary technologies such as data analytics and artificial intelligence so that auditors can rely on them, thereby shifting the role of SAIs from "error-detectors" to "strategic partners" who guide the audited entities through their audit reports toward achieving standards of efficiency, effectiveness, and economy in order to realize their strategic objectives in light of available resources, thereby improving the efficiency of public spending and its impact on citizens' lives.



Source: Adobe Stock Images, elenabsl

Digital Governance and Technological Innovation in Performance Audits

Author: Abdulrahman Alebrahim, Auditor, State Audit Bureau of Kuwait

The field of performance audit is transitioning from manual retrospective evaluations to real-time and prospective analysis due to the infiltration of technologies such as Big Data, artificial intelligence (AI) and predictive modelling, that is reshaping the efficiency and effectiveness of the audit function. As public institutions increasingly rely on data-driven systems for decision making, the complexity of governance frameworks also increases emphasizing the need for greater scrutiny of such institutions to strengthen transparency, accountability and public trust (Agostino, Lourenco & Jorje, 2025).

Digital transformation has proliferated across both public and private sectors, resulting in the generation of enormous volumes of structured and unstructured data that cannot be effectively analysed using conventional audit approaches alone (Basuki, Atarwaman & Layn, 2025). Hence, the need for innovation in performance audit has become more prominent than ever, calling for the development of new tools and techniques to match the dynamics of modern information ecosystem.

The emergence of digital governance and an integrated system has created a more sophisticated audit environment that requires continuous monitoring and instant vigilance systems capable of detecting risks and inefficiencies in near real time. Audit planning, execution and follow-up are now utilizing emerging technologies to map different data sources of the institution and integrate them into the audit plan to offer a more robust audit of processes (Sofyani et al., 2026). For example, Supreme Audit Institutions (SAIs), independent national agencies tasked with auditing government spend and earnings, use advanced data analytics systems to identify statistical anomalies, illicit patterns of transactions and identify hidden or laundered funds with much higher accuracy than traditional document-reliant audit processes that had a narrow lens of observation (Kalaintzis, 2025). With data analytics, the information universe has expanded that allows auditors to incorporate implicit information which was otherwise not considered in traditional audits. Data visualizations, live dashboards, and automated alerts allow performance auditors to share insights more immediately with stakeholders and configure their audit plans in real time to reduce inefficiencies in the audit process.

According to multiple case studies published by INTOSAI, the integration of big data and AI has improved the detection of irregular procurement patterns, evaluation of social welfare programs and monitoring of infrastructure programs more comprehensively than before. A survey conducted by SAI Egypt reveals that 92% of the respondents agree to the notion that AI enhances audit results while 87% back the use of AI in risk assessments (Du, 2026). Thus, an overwhelming majority of practitioners support the use of AI and Big Data analytics as human expertise is greatly complimented by the use of sophisticated technologies.

Take the case of Australian National Audit Office, which is an example of successful implementation of data analytics for risk-based performance audit planning in government grant programs. Auditors were able to identify contracts which were awarded before tender closure, revealing non-compliance, bribery and fraudulent practices in the government sector by comparing tender databases, contract awards, and procurement timelines (ANAO, 2021). By expanding their information universe to include emails, official communications and schedules, an innovative approach was used allowing the investigation to reveal misconduct which would otherwise be lost in manual evaluations. Such examples illustrate how analytics-driven auditing improves efficiency while also increasing the reliability of audit findings.

Modern data analytics platforms, such as Apache Spark, are widely used by SAIs to audit entire population of data of an institution, instead of selecting a sample (Singh et al., 2023). This effectively reduces the sampling and detection risk that auditors mostly face and makes the detection of anomalies and fraud indicators much faster. Tableau is another software that integrates interactive dashboards with auditor's worksheets and derives information from millions of data points that enables detection of suspicious procurement patterns, unusual financial transactions, or deviations from established operational benchmarks, making it time and cost-effective to identify misconduct in government agencies.

Time and cost-effectiveness have been cited as the key benefits of using technology in performance audit and the case of an environmental audit in India stands as an epitome of this. Due to several plantation sites being inaccessible to auditors, satellite programming was used to deploy AI-powered imagery of plantations to estimate the tree height, measure the density of the canopy and identify the type and density of vegetation to verify the assertions in an environmental audit, saving the auditors time and cost involved in commuting to the plantations and physically inspecting it (Du, 2026). This technology is being evolved into geospatial technologies and Geographic Information Systems (GIS) that will have immense utility for performance audits that involve infrastructural and development project testing (Almarzooqi, 2021). GIS tools can be used by auditors to visualize spatial data, assess project implementation topographically and verify whether public investments align with the announced outcomes of projects. It will serve as a useful tool to evaluate the performance of governmental projects that are funded by taxpayer money to determine if the project's costing and expenditure aligns with the approved plans and if the resources are being utilized efficiently (Abdulajabbae et al., 2025). One example of its potential use can be for auditors to examine road construction projects by comparing satellite imagery with completion reports from ground, comparing budget allocation with actual spend and identifying any abandoned or incomplete infrastructure through satellite images. Such tools strengthen evidence-based auditing and reduce reliance on potentially inaccurate administrative reports.

Another important area of technology that is widely discussed in auditing journals is the use of real-time data analytics and the potential of blockchain technology. According to a study on real-time analytics, governments are increasingly using cloud infrastructures, electronic procurement systems, treasury platforms, and networked digital systems that generate constant streams of transactional data (Koulantzis, 2025). These data streams can be incorporated by auditors into analytical engines that provide real-time activity monitoring. These skills are especially helpful in managing public finances, as prompt identification of anomalies can stop the misappropriation of public monies before serious harm is done. By allowing management to react quickly to risk that is recognized, real-time auditing also promotes greater responsibility. This is particularly useful for performance audits, as the objectives of performance audit are much wider than financial audits. The aim is to verify the integrity of the organization in fulfilling its stated objectives and for public institutions that deal with people's resources, it is imperative to have auditing systems that recognize anomalies in time to prevent potential exploitation of public's funds (Sofyani et al., 2026).

Moreover, blockchain technology has also played an influential role in bringing about innovations in auditing practices. Auditors can use blockchain to verify transactional authenticity, monitor supply chain activities, and evaluate compliance with contractual obligations (Morgan, 2024). More prominently, smart contracts seem to have strong potential in the auditing as they recognize contracts when the underlying conditions are met, reducing the chances of manual meddling of contractual amounts or distorting financial results (Larikova et al, 2023). Smart contracts provide auditors with a higher degree of transparency in digital evidence and display audit trails that simplify performance evaluation and compliance testing.

Predictive analytics is another important tool that performance auditors have used to verify the assumptions used in budgeting of public funds and government expenditure. Predictive modelling can identify potential cost overruns, operational failures, expected deviations in accounts and areas most prone to underperformance based on past performance and future price changes (Govekar, 2025). Auditors can use such tools to perform comparative analysis and identify market indicators of prices and other indices used by competitors and benchmark against their client to judge the reasonable of their estimates. This way, budgetary slacks or overestimations can be identified that will prevent the misallocation of public funds.

Thus, auditors have access to multi-disciplinary insights such as climate change, sustainability impacts, market price movements and cybersecurity risks that can be incorporated into performance audits through AI-driven data analytical techniques. Performance audits are transforming into more agile systems that emphasize flexibility, adaptability and continuous stakeholder engagement. The audit cycles are becoming shorter yet more effective due to data-driven planning and execution that has improved the accuracy and volume of audit testing and provided multi-faceted expertise to performance auditors. However, organizations such as INTOSAI and OECD continue to emphasize that innovative audit techniques that are AI or data-driven should be accompanied by strong governance frameworks, ethical oversight, and professional judgment as algorithms are also prone to errors and manipulation (OECD, 2026). Despite these challenges, emerging technologies continue to reshape the way performance audits are being conducted worldwide and are increasingly being incorporated by auditors to streamline error detection and identification of fraud based on objective assessment of digital evidence, to strengthen governance structures and improve transparency.

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Source: INTOSAI Development Initiative

INTOSAI Donor Cooperation – the Journey and Possible Way Forward

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As the INTOSAI Development Initiative (IDI) marks its 40th anniversary, it is timely to reflect on an important milestone: the establishment of the INTOSAI-Donor Cooperation (IDC) in 2009. Over the years, the IDC has become an important platform for helping the INTOSAI community, including IDI, engage more effectively with development partners. With the INTOSAI-Donor Cooperation Strategy 2020–2030 now entering its final phase, and with official development assistance undergoing major shifts, this is also an opportune moment to consider how the Cooperation can be repositioned to maximise its future value.

The History

The INTOSAI-Donor Cooperation (IDC) was established to address a long-standing global challenge: many Supreme Audit Institutions (SAIs), particularly in developing countries, lacked the capacity, independence, and resources needed to oversee public finances effectively. Although donors had supported SAIs for decades, this support was often fragmented, duplicative, or insufficiently aligned with country needs. In response, INTOSAI and major development partners came together in 2009 to create a more coordinated and strategic approach to strengthening SAIs worldwide.

A key milestone came on 20 October 2009, when INTOSAI and fifteen donor organisations signed a Memorandum of Understanding (MoU). This agreement established the INTOSAI-Donor Cooperation and committed to shared priorities for both communities:

- A shared strategic framework for SAI capacity development
- Better coordination of donor support
- Increased and more predictable funding
- Stronger alignment with international aid effectiveness principles
- A sustained focus on SAI independence and long-term institutional strengthening

The MoU attracted additional signatories. Over time, the donor group expanded to twenty-three organisations, including multilateral development banks, United Nations agencies, and bilateral development partners. The Cooperation became the first global platform dedicated specifically to aligning and scaling up support for SAIs.

Building the Cooperation's Foundations (2009-2018)

The IDC's early years focused on establishing the structures, governance arrangements, and practical tools needed to turn the Memorandum of Understanding into an effective platform for action.

INTOSAI and the donor community created and co-chaired a Steering Committee to guide the Cooperation. It set priorities, monitored progress, and helped ensure that both communities remained committed to the principles of the MoU.

Key Achievements

In its early years, the INTOSAI-Donor Cooperation built a stronger evidence base for support to SAIs. One of the Cooperation's first milestones was to undertake the Global Stocktaking which showed that many SAIs faced medium- to high-capacity development needs, while follow-up surveys indicated progress in financial, compliance, and performance auditing. This helped the Cooperation identify priorities and shape more targeted support.

During this period, the Cooperation introduced important tools and support mechanisms, including the SAI Performance Measurement Framework (SAI PMF) and the SAI Capacity Development Fund. Meanwhile, an independent external evaluation found evidence of positive behavioural change among both donors and SAIs and offered recommendations to strengthen impact. The Secretariat's work was supported by financial contributions from Austria, Australia, Ireland, France, Norway, Switzerland, and the United Kingdom, alongside in-kind support from SAI Brazil, SAI Norway, and others.

As the Cooperation matured, it also introduced new mechanisms to better connect SAI needs with donor resources. One of its flagship initiatives was the Global Call for Proposals, launched in 2015. This mechanism enabled SAIs—especially those with limited access to donor support—to submit proposals for capacity development, which donors could then consider for funding or technical assistance.

By 2018, the Global Call for Proposals had received more than 100 submissions, with around half successfully matched to support providers. To help SAIs define their needs more clearly and engage more effectively with donors, the IDC later introduced a two-tier support model.

The Current Phase (2018-2026)

Through its support mechanisms and related initiatives, the Cooperation helped mobilise significant resources. In 2018 alone, it facilitated USD 83 million in committed support across global, regional, and national levels.

In 2018, the Steering Committee requested that IDI integrate the Cooperation's functions into its regular operations. As a result, the Cooperation would no longer operate as a separate ring-fenced entity hosted by IDI. IDI agreed to this arrangement and has since continued with the Cooperation's functions.

This period also coincided with the adoption of the 2020-2030 Strategy, approved by the IDC Steering Committee at its 12th meeting in Tokyo, Japan, in July 2019. The Strategy was built around four strategic goals:

- Independent, professional, capable, transparent, and well-governed SAIs
- Enhanced partnerships and scaled-up support to SAIs
- SAI-led capacity development
- Agenda 2030 and the achievement of the Sustainable Development Goals

During this phase, the Cooperation met important milestones, including:

- Strengthened engagement on SAI independence, including the development of the SAI Independence Rapid Advocacy Mechanism at the request of the European Commission, the appointment of the first IDC Goodwill Ambassador on SAI Independence, and support for the World Bank's Independence of SAI (InSAI) assessment tool.

- Enhanced support to SAIs through dedicated initiatives such as PAP-APP, the Accelerated Peer-support Partnership, the Global SAI Accountability Initiative (GSAI), the Central Asian Accountability Initiative (CASAI), and the Saudi Fund for Improved SAI Performance (Saudi FISP).

- Deeper engagement with SAIs and development partners on key issues such as the audit of donor-funded projects, where reliance on SAIs has increased significantly. A notable example is engagement with the Global Fund and Gavi, where SAIs are playing a growing role in strengthening accountability in the health sector.

This phase also exposed important challenges. The number of signatories to the MoU has stagnated, and financial support to SAIs appears to have declined in recent years. The reason this matters is because the original rationale for the Cooperation was not only to improve coordination, but also to help mobilise stronger, more predictable, and better-aligned support for SAI development. Reduced funding raises questions about whether SAIs are receiving sufficient attention within the wider development financing landscape, particularly at a time when public accountability, debt oversight, and the effective use of scarce resources are becoming even more critical. For the IDC, this reinforces the need to renew its value proposition, strengthen its strategic outreach, and make a clearer case for why investment in SAIs should remain part of broader governance and financing-for-development agendas.

The Way Forward

While the strategic direction remains highly relevant, the global context has changed significantly. Fiscal pressures, rising debt vulnerabilities, governance and integrity risks, and declining public trust in institutions all demand strong accountability ecosystems. At the same time, digital transformation and greater data availability are reshaping how coordination and knowledge exchange can take place.

The agenda emerging from the Fourth International Conference on Financing for Development (FFD4) adds further relevance to this discussion. The Sevilla Commitment and its outcome framework place strong emphasis on expanding fiscal space, addressing debt vulnerabilities, improving the effectiveness of international development cooperation, and reforming the international financial architecture. These priorities speak directly to the IDC's comparative advantage: helping position SAIs as part of the solution to better public financial management, stronger domestic accountability, and more credible, country-led use of development finance. In that sense, the FFD4 agenda offers the IDC an opportunity to frame support to SAIs not only as an institutional governance issue, but also as a practical contribution to more effective and accountable financing for development.

In this context, the IDC is well-positioned, but not yet fully leveraged, to serve as a visible, dynamic, and influential global platform. Current engagement remains centred on annual Steering Committee meetings, while digital tools and knowledge assets could be modernised to better support coordination, influence, and learning.

A revitalised IDC could align with the following mutually reinforcing pillars:

- Visibility and strategic outreach: reposition the IDC from a coordination platform into a stronger strategic voice and a recognised global reference point for SAI capacity development and accountability partnerships.

- Knowledge, innovation, and coalition building: move beyond coordination towards thematic leadership by strengthening the IDC's role as a hub for knowledge generation, consolidation, and innovation.

- Continuous engagement and coordination: transform the IDC from an annual event into a year-round platform for dialogue, collaboration, and joint action.

These initiatives would not replace the current IDC Strategy. Rather, they would help translate it into concrete, time-bound actions that are also responsive to the wider financing-for-development debate. By aligning more explicitly with the global momentum around the FFD4 commitments, the IDC can strengthen its strategic relevance and show how investment in capable, independent, and credible SAIs contributes to more effective, accountable, and sustainable development financing.



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