

SAls Innovation Marketplace Webinar



IDEAS FOR INTEGRATING AI IN TO SAIs' AUDITING ACTIVITIES

"The Accountability State Authority-Egypt"

The 26th of November 2024

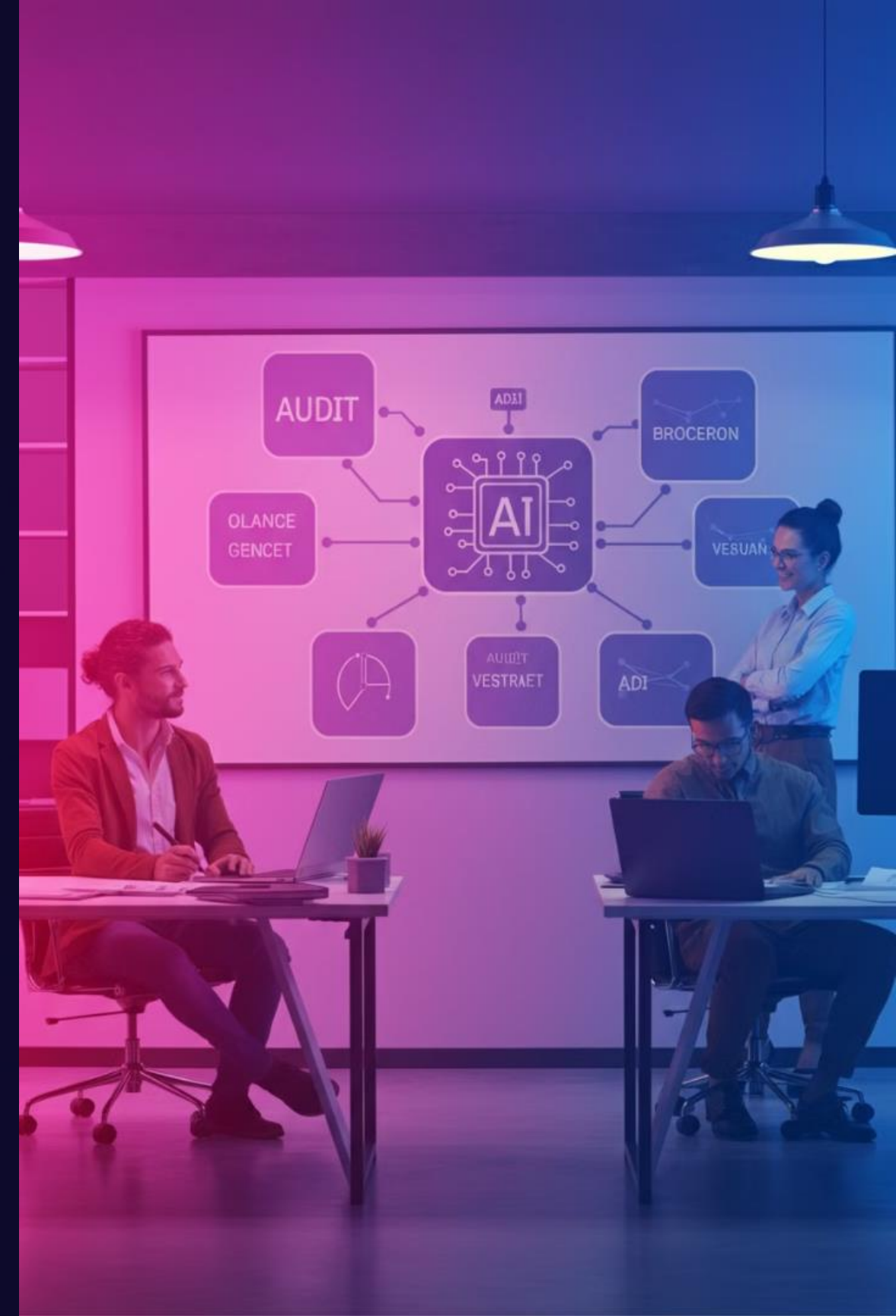


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1- What is AI ?

Artificial Intelligence (AI) is a branch of computer science which focuses on creating machines that can perform tasks typically requiring human intelligence. These tasks include problem-solving, decision-making, understanding language, recognizing patterns, and even learning from data.

AI systems are trained using algorithms that allow them to process vast amounts of information, recognize patterns, and make predictions or decisions based on the data they've processed.



AI-Evolution



1950s

Early Foundations

The field of AI was formally established at the Dartmouth Conference in 1956. Alan Turing, a pivotal figure, introduced the "Turing Test" to assess a machine's ability to exhibit human-like intelligence.



1960s to 1970s

Growth in Research

Early AI focused on rule-based systems and symbolic reasoning. Researchers like John McCarthy and Marvin Minsky made significant contributions with programs that could solve simple problems, but lacked the ability to generalize knowledge effectively.



1980s

Expert Systems

AI advancements led to the development of Expert Systems, which used knowledge databases and inference rules to tackle specific problems, such as medical diagnosis. This period saw significant investments from companies and governments, although AI still had limitations.



1990s

Machine Learning and Data-Driven Approaches

AI shifted towards machine learning (ML), where systems learn from data instead of relying on predefined rules. AI programs like IBM's Deep Blue defeated chess champion Garry Kasparov, demonstrating the power of AI in strategic games.



2000s

Big Data and Neural Networks



2010s to Present

AI in Everyday Applications

2- AI Strategy Framework



Vision

A clear and compelling picture of how AI will contribute to the organization's future with clearly defined objectives.



Risk

Effective risk management, associated with AI implementation, in the context of a framework, is required.



Value

Driving tangible benefits for the organization encompasses opportunities identification, value creation, and establishment of success metrics.



Adoption

Practical implementation of AI technologies within the organization and fostering a culture of innovation.



Assessment

The process of assessing the potential benefits, viability, and risks of implementing AI.

3- Integrating AI in SAls' auditing Activities



1- Data Analysis



2- Risk Assessment



3- Predictive Analysis



4- Natural Language Processing (NLP)



5- Fraud Detection



6- Compliance Monitoring



7- knowledge managment & Decision support



8- Qulaity Control

1-Data Analysis

Data analysis is the process of examining and organizing data to find useful information, patterns, and trends. It helps people make better decisions by turning raw data into something understandable and meaningful.

AI tools for data analysis are software, programs, or libraries designed to streamline and empower different stages of the data analytical process. Such tools can automate various analytical tasks, such as data collection from multiple sources, cleaning and organizing the data, predictive modeling, segmentation, etc., using machine and deep learning algorithms.

In addition, Machine learning algorithms can identify patterns, anomalies, and trends in financial records, helping auditors focus on areas that require closer examination.



Integrating AI powered Data Analysis

Added Value

AI-powered analysis can be a game-changer for auditors, enabling them to rapidly process and extract insights from vast troves of financial and operational data. By leveraging the speed and precision of artificial intelligence, auditors can uncover patterns, trends, and anomalies that may have previously gone unnoticed.

Uncover hidden insights in financial data with machine learning algorithms, pinpointing patterns and anomalies to guide auditors' scrutiny.

2- Risk Assessment

AI-powered risk assessment is the use of artificial intelligence to identify, evaluate, and prioritize potential risks within an organization.

AI algorithms can sift through mountains of financial records, operational data, and other information sources to uncover patterns, trends, and anomalies that may signal potential risks.

By prioritizing risks based on their likelihood and potential impact, organizations can allocate resources more effectively and implement targeted mitigation strategies to safeguard their operations and financial status.



Integrating AI-Risk Assessment

Added Value:

AI can assign risk scores to different transactions, departments, or processes based on a range of factors like financial performance, compliance records, or market conditions. This helps prioritize high-risk areas that require more attention.

AI can simulate different scenarios to assess how certain changes (e.g., market shifts, new regulations) might impact the organization, helping to prepare for potential risks in various situations.

Moreover, AI-powered risk assessment can evolve and adapt over time, continuously learning from new data and refining its risk identification models. This dynamic approach enables organizations to stay ahead of emerging threats and adapt their risk management strategies accordingly, fostering a more proactive and resilient risk management culture.

3- Predictive Analysis

Predictive analysis is a way of using data to make educated estimates about what might happen in the future. It involves looking at past data, identifying patterns or trends, and using them to predict future outcomes.

AI can significantly enhance predictive analytics by leveraging advanced machine learning (ML) algorithms to analyze historical data and identify future trends, especially in the field of financial data.



Integrating AI-Predictive Analysis

Added Value:

Internal Control Weakness Prediction: AI can analyze historical audit data and performance metrics to predict where internal controls are likely to fail. This helps auditors focus on improving or reinforcing those controls before weaknesses lead to financial or operational risks.

Cash Flow and Revenue Forecasting: Predictive models can forecast a company's future financial performance, including cash flows and revenue. Auditors can use these forecasts to assess whether current financial statements align with expected trends or if there are discrepancies that require investigation.

Proactive Risk Management: instead of reacting to risks after they occur, auditors can use predictive analysis to anticipate and mitigate risks in advance.

By integrating AI-powered predictive analysis, auditors can shift from traditional, reactive auditing methods to more proactive and data-driven approaches. This enhances the overall audit quality, increases risk detection, and enables auditors to provide valuable, forward-looking insights to organizations.

4-Natural Language Processing (NLP)

Natural Language Processing (NLP) is a field of artificial intelligence that focuses on how computers can understand, interpret, and respond to human language. It's what enables machines to read, listen, and even generate text in a way that feels natural to us. Common examples of NLP include virtual assistants like Siri or Alexa, language translation tools, and even chatbots that help answer questions online.

Natural Language Processing (NLP) allows AI tools to analyze unstructured text data. In data analytics, NLP will enable users to extract meaningful insights from text data.



Integrating NLP in Audit work

Added Value

NLP can add value to the auditors by extracting insights from different audit reports across years, sectors, or organizations. By analyzing large volumes of unstructured text data, NLP can help identify patterns, trends, and anomalies that may not be easily detected through manual review.

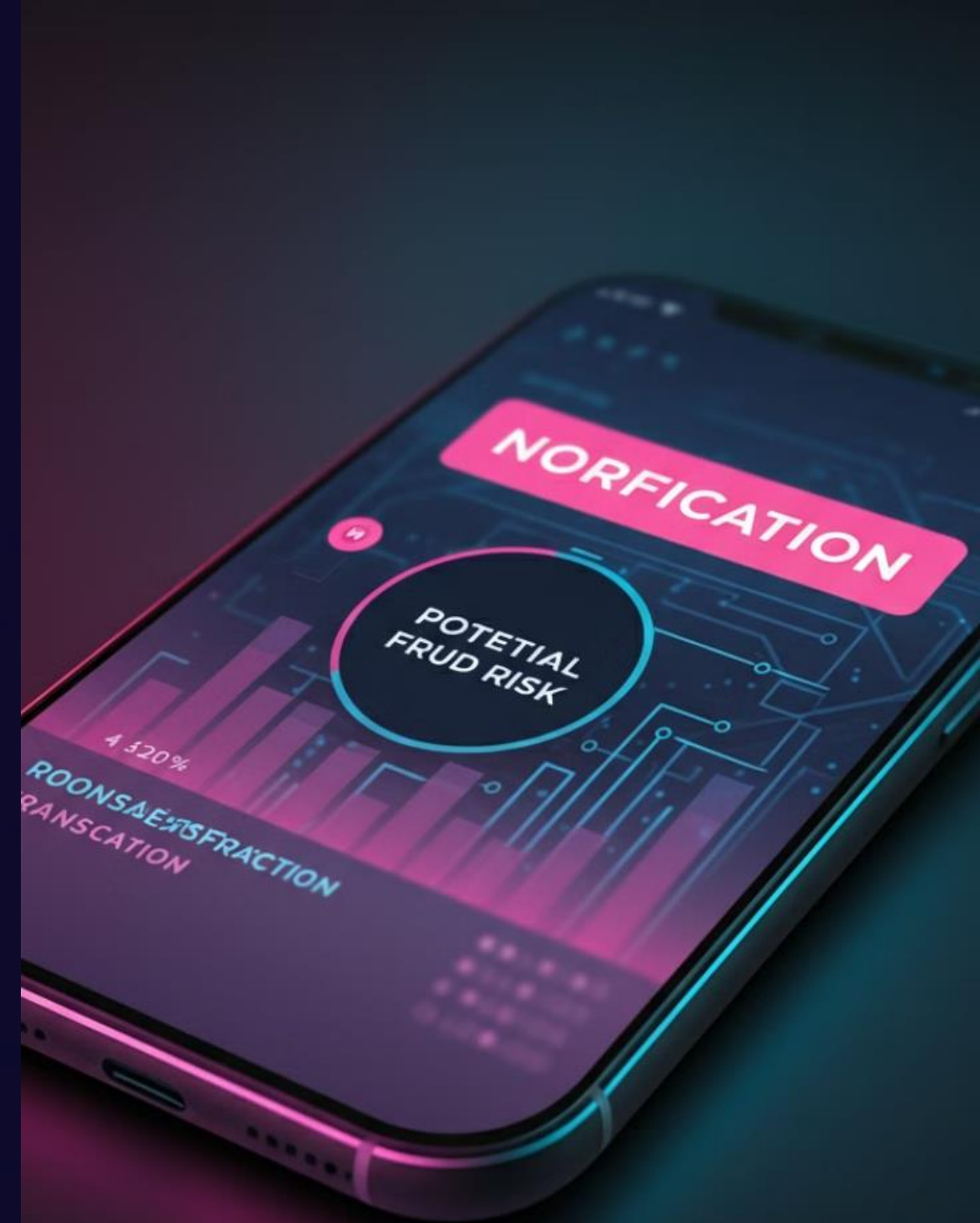
NLP could be used to analyze the wording and tone of audit reports to detect potential areas of risk or concern. It could also be leveraged to consolidate and summarize key findings and recommendations from multiple reports, providing auditors with a high-level overview of the organization's performance and compliance.

5-Fraud Detection

Fraud detection is the process of identifying dishonest or illegal activities, like stealing money or manipulating information, usually in financial transactions or business operations.

By leveraging machine learning algorithms, AI-based systems can rapidly analyze vast amounts of financial data, transaction records, and other relevant information to identify anomalies, patterns, and red flags that may indicate the presence of fraudulent activities.

AI-powered fraud detection can uncover subtle discrepancies and suspicious transactions that may have previously slipped through the cracks, allowing organizations to take proactive measures to address these issues and mitigate the associated risks.



Integrating AI-Fraud Detection

Added Value

AI can help auditors trace fraudulent activities by analyzing how transactions move through systems, identifying patterns of deception. This is particularly useful in cases of complex fraud schemes where manual detection would be too slow or difficult.

AI can quickly spot anomalies—irregular activities or transactions that deviate from normal business operations. For example, it can detect unusually high-value transactions processed outside of business hours, which might suggest fraudulent activities.

6-Compliance Monitoring

Compliance monitoring is the process of regularly checking and assessing whether an organization is adhering to laws, regulations, standards, and internal policies. It involves evaluating the company's practices and procedures to ensure they meet legal and regulatory requirements, industry standards, and organizational policies.

AI systems can continuously monitor transactions, activities, and operations in real-time, ensuring they align with legal and regulatory requirements as well as internal policies. This allows for immediate detection of non-compliance issues.



7-Knowledge Management and Decision Support

Knowledge Management (KM) refers to the systematic process of capturing, distributing, and effectively using knowledge within an organization. It encompasses practices and technologies used to identify, create, represent, and distribute knowledge.

Decision Support Systems (DSS) are computer-based information systems that help decision-makers analyze data and make informed decisions. DSS combines data, sophisticated analytical models, and user-friendly interfaces to facilitate decision-making processes.



Integrating AI-KM &DSS

Added Value

Document Indexing and Tagging: AI algorithms can categorize and tag documents based on their content, making it easier to retrieve relevant information when needed.

Chatbots and Virtual Assistants: AI-powered chatbots can provide instant access to knowledge and resources by answering common queries, guiding users to relevant documents, or connecting them with experts in specific areas.

Recommendation Systems: AI can recommend relevant training materials, courses, and knowledge resources based on an employee's role, previous learning experiences, and current projects.

Enhanced Decision Quality: Provides comprehensive data analysis and modeling capabilities, leading to better-informed decisions.

Faster Decision-Making: Reduces the time needed to gather and analyze information, allowing for quicker responses to changing circumstances.

Knowledge Management focuses on the effective use and sharing of knowledge within an organization, while Decision Support Systems provide the tools and data needed to analyze information and make informed decisions. Together, they enhance an organization's ability to learn, innovate, and adapt in a rapidly changing environment.

8-Quality Control

Quality Control refers to the processes and activities used to monitor, measure, and verify the quality of products or services. It focuses on identifying defects or deviations from standards and ensuring that the output meets predetermined quality criteria.

AI can significantly enhance Quality Control (QC) in auditing by improving accuracy, efficiency, and the ability to detect anomalies.



Integrating AI- Quality Control

Added Value

Error Reduction: AI can minimize human error in data entry and analysis, ensuring a higher level of accuracy in audit findings. This is particularly important in data-intensive environments where manual analysis may lead to oversights.

Standardization: AI can apply consistent criteria and processes across audits, reducing variability in quality and ensuring that all audits adhere to the same standards.

Dynamic Report Generation: AI can automate the generation of audit reports, summarizing findings and highlighting key metrics in a standardized format. This speeds up the reporting process and ensures that reports are consistent and accurate.

4- AI-enhanced tools in auditing

AI tools are increasingly used in audit work, data analysis, and related fields. These powerful technologies can help improve efficiency, accuracy, and generate valuable insights for auditors and decision-makers.



ACL Analytics / Galvanize

ACL Analytics (now known as Galvanize) is a powerful data analytics and visualization platform designed to enhance audit, risk management, and compliance functions within organizations.

ACL Analytics provides a suite of tools for data extraction, transformation, and analysis, allowing users to perform complex calculations, statistical analyses, and data comparisons.

The platform enables auditors to create statistical samples for testing, ensuring representative and effective analysis.



KPMG Clara

KPMG Clara is KPMG's innovative digital platform designed to enhance audit processes through advanced technology and data analytics.

KPMG Clara combines various technologies, including artificial intelligence, machine learning, and data analytics, to streamline the audit process and improve efficiency.

KPMG Clara represents a significant advancement in the audit profession, combining technology and expertise to deliver more efficient, insightful, and high-quality audits.



SAS Audit Analytics

SAS Audit Analytics is a powerful suite of tools and technologies offered by SAS (Statistical Analysis System) designed to enhance the auditing process through advanced data analytics.

The platform provides tools for both descriptive analytics (to understand historical performance) and predictive analytics (to forecast future trends), allowing auditors to gain deeper insights into potential risks.

The platform can automate the generation of audit reports, summarizing findings and key metrics in a standardized format, thus improving efficiency and consistency.



CaseWare IDEA

CaseWare IDEA (Interactive Data Extraction and Analysis) is a powerful data analysis and auditing software tool designed for auditors, accountants, and financial professionals.

It enables users to efficiently extract, analyze, and visualize data from various sources to enhance their auditing processes and improve decision-making.



5-Limitation of using AI



Technical Challenges

AI systems require large amounts of data for training.



Ethical Concerns

Bias in data can lead to unfair or discriminatory outcomes.



Social Impact

AI can displace jobs and raise concerns about privacy.

Data Dependency and Quality



Data Requirements

AI systems require large amounts of data for training. Incomplete, biased, or poor quality data will result in flawed AI outputs.



Bias in Data

AI models can perpetuate biases present in their training data, leading to skewed results. For example, facial recognition technologies have shown higher error rates for certain ethnicities due to biased training data.

Explainability and Transparency



Black Box Problem

Many AI models, especially deep learning algorithms, function as "black boxes," meaning their decision-making processes are not easily understood or explained.



Lack of Accountability

When AI makes decisions that affect people's lives, there's a challenge in identifying responsibility if something goes wrong.

Ethical and Legal Issues

AI systems can inadvertently reinforce societal biases, leading to discrimination in hiring practices, law enforcement, and healthcare services.

AI often requires access to vast amounts of personal data, raising concerns over how that data is collected, stored, and used.



High Costs and Resource Intensity



Development and Maintenance Costs

Implementing AI systems can be expensive, requiring significant investments in technology infrastructure, data storage, and skilled personnel.



Energy Consumption

AI models, especially deep learning models, require enormous computational power, which leads to high energy consumption.

Security Concerns



Vulnerabilities to Cyberattacks

AI systems can be targeted by cyberattacks, compromising their safety.



Manipulation of Algorithms

Hackers can manipulate AI algorithms or inject false data to alter their output.

6-Responsible AI



Responsible AI

refers to the development and deployment of artificial intelligence systems in a manner that is ethical, transparent, and accountable. The goal is to ensure that AI technologies are used in ways that are beneficial to individuals and society as a whole, minimizing risks and addressing potential harms.



key concepts

- Fairness
- Transparency
- Accountability
- Safety and Security

7-AI Adoption methodology in SAIs'

Strategic Planning

Develop a comprehensive AI strategy aligned with SAIs' goals and objectives. This should involve identifying key AI use cases, prioritizing initiatives, and setting clear performance metrics for success.

1

Skills Development

Train auditors on AI concepts and tools to enhance their capabilities. This can be achieved through targeted training programs, workshops, and mentorship opportunities to equip auditors with the skills to effectively utilize AI in their work.

3

Data Infrastructure

Invest in robust data infrastructure to support AI applications. This includes ensuring access to high-quality data, building secure data storage and management systems, and implementing data governance policies.

2

Ethical Considerations

Establish clear ethical guidelines for responsible AI use in auditing. This includes addressing potential biases in data and algorithms, ensuring transparency in AI-driven decisions, and protecting the privacy of individuals involved in audits.

4



THE ACCOUNTABILITY STATE AUTHORITY OF EGYPT will host the XXV INCOSAI IN 2025

The following themes will be discussed:

- Theme I – The role of SAs in auditing the government activities and central banks during financial and economic crises.
- Theme II – Using artificial intelligence techniques in auditing.

Hence, SAI Egypt has the honor to invite you to join this dynamic exchange, where you will have the opportunity to explore the myriad applications of AI in the realm of public sector auditing and discussing the complexities of AI integration into core audit functions. we would also like to invite you to interact with your counterparts from the INTOSAI community and share your experiences and expertise with this diverse group.

Thank You

We appreciate your time and interest in this presentation.

