

**2024** **INTERNAL AUDIT**  
**WEBCAST SERIES**

**Course 1**

# **NextGen Technology and Analytics for Internal Audit**

March 26, 2024



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2024 **INTERNAL AUDIT**  
**WEBCAST SERIES**

# BDO and Our Internal Audit Webcast Series



# Savvas Georgopoulos

ANALYTICS & INNOVATION MANAGING DIRECTOR, RISK ADVISORY SERVICES, BDO USA

Savvas is a Managing Director in BDO's Risk Advisory Services and leads the Innovation and Analytics practice. Savvas has more than 20 years of strategy and implementation experience supporting Fortune 500 clients with large digital strategy and solution implementation initiatives. His responsibilities range from developing strategies for optimizing Internal Audit functions, leading the implementations of technology solutions to automate audit and control procedures, and enabling data driven risk management and continuous monitoring with the use of analytics.

Prior to joining BDO, Savvas led the Intelligent Automation practice of a Big Four firm's Risk and Regulatory group focusing on helping Internal Audit functions drive adoption of digital technologies to improve their Compliance processes. Savvas has significant experience supporting clients in financial services, retail, pharma, manufacturing and technology sectors.

## EDUCATION

- ▶ MBA, Marymount University
- ▶ BBM, Athens University of Applied Science



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# Shana McGee, CIA

ANALYTICS & INNOVATION DIRECTOR, RISK ADVISORY SERVICES,  
BDO USA

Shana McGee is a Director with over 18 years of audit and consulting experience, with four of those years working for a Big Four firm. Her experience includes managing Internal Audit, Sarbanes-Oxley compliance, data analytics and automation, IT, and contract compliance projects.

Her experience and data analytics skill set allows her to identify risk areas by analyzing client system data for potential fraud, noncompliance of company policies, inefficient business processes, and excessive company costs. Shana is currently a member of the National Innovation team for RAS where she assists in the development of data analytic visualizations and automation solutions to help streamline SOX and internal audit procedures as well as provide continuous monitoring tools for clients.

## EDUCATION

- ▶ B.B.A., Business Administration, LeTourneau University, Houston, Texas

## PROFESSIONAL AFFILIATIONS

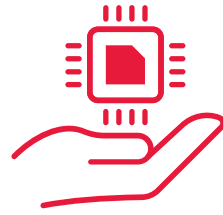
- ▶ Certified Internal Auditor
- ▶ Institute of Internal Auditors, Houston Chapter



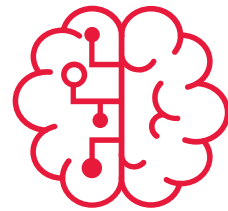
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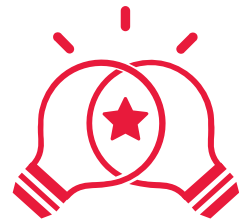
## Learning Objectives



Describe the evolution of technologies available to support internal audit



Present value-added use cases for Internal Audit based on ChatGPT and OpenAI



Present an Auditor's Approach for auditing GenAI and having insightful conversations with management regarding the adoption of such technologies

# The Evolving Lifecycle of Internal Audit



# The Internal Audit Function of the Future

The internal audit and compliance **function of the future** has the following characteristics:

## PROCESS

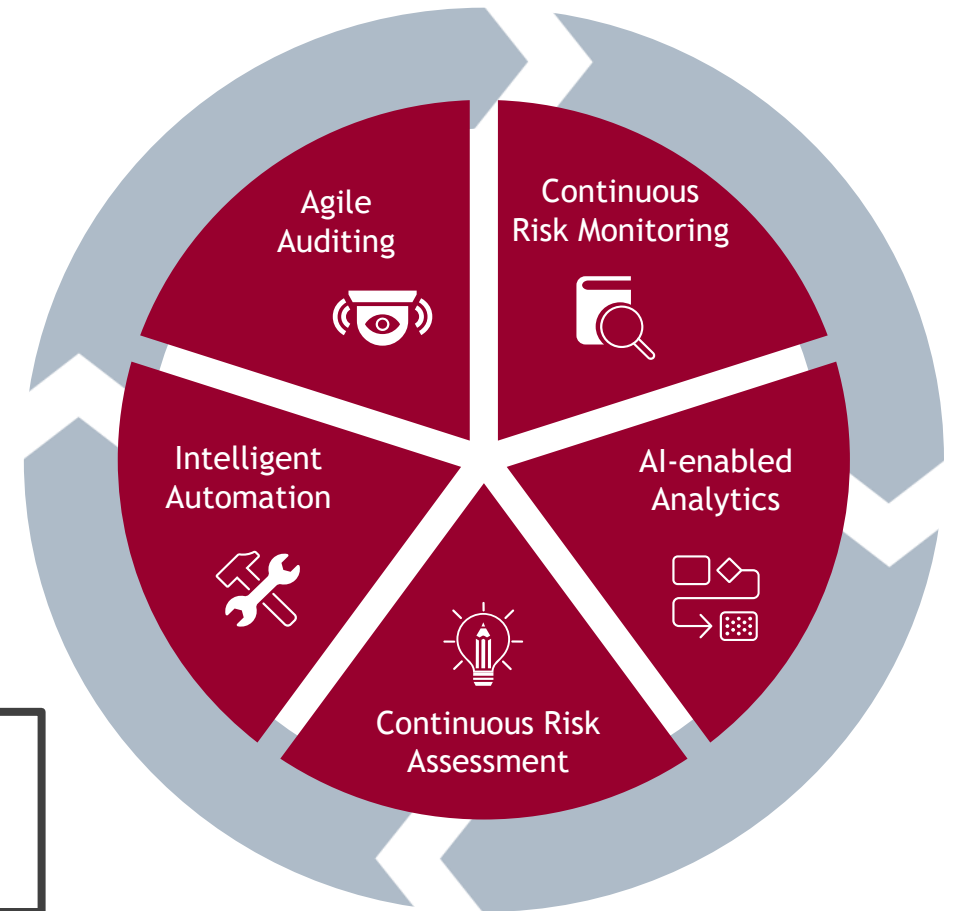
- ▶ Focuses on risks that are strategically important
- ▶ Is positioned as a value creator for the enterprise
- ▶ Is built on common risk taxonomy and indicators

## TECHNOLOGY

- ▶ Is dynamic and agile
- ▶ Is powered by data leveraging automation and analytics
- ▶ Utilizes continuous risk monitoring solutions

## PEOPLE

- ▶ Established a common sense of purpose for all risk stakeholders
- ▶ Puts risk managers and auditors on the forefront of the transformation



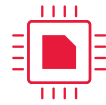
## TECHNOLOGY ENABLERS



Advanced Analytics



Process Intelligence



Robotics



Artificial Intelligence (AI)

# The Digital Ecosystem for Internal Audit and Compliance Functions

Digital transformation is achieved through a variety of tools and techniques. Leading Internal Audit teams are combining multiple tools from the ecosystem to reach their specific vision and goals.

Data Automation	Advanced Data Analytics	Robotic Process Automation	Generative AI
<p><b>Data wrangling and transformation tools</b> to discover, merge, interpret and summarize large data sets.</p> <ul style="list-style-type: none"><li>▶ Decreases process time</li><li>▶ Enables repeatable process</li><li>▶ Automates manually intensive mundane tasks</li><li>▶ Creates resource capacity for more strategic work improving employee satisfaction</li><li>▶ Test 100% of the population</li><li>▶ Increase coverage areas using automation</li><li>▶ Automatically create/ populate workpapers</li></ul>	<p><b>Graphical representation</b> of data to quickly analyze large data sets through <b>interactive</b> charts and graphics with drill down capabilities to drive insights</p> <ul style="list-style-type: none"><li>▶ Decreases process time</li><li>▶ Instantly recognize patterns in the data and analyze millions of data points</li><li>▶ Creates more time for analyzing insights, trends and business value generation</li><li>▶ Share audit insights and findings via visual depictions</li><li>▶ Automate the audit reporting process</li></ul>	<p>Computer software or a “robot” that <b>emulate and integrate the actions of a human interacting within digital systems</b> to execute a process.</p> <ul style="list-style-type: none"><li>▶ Decreases process time</li><li>▶ Ability to run 24/7 performing manually intensive tasks</li><li>▶ Streamlines testing processes</li><li>▶ Reduces outsourcing, offshoring and operations</li><li>▶ Creates resource capacity for more strategic work &amp; analysis</li></ul>	<p><b>Generative AI</b>, such as <b>ChatGPT</b>, is a type of AI technology that broadly describes <b>machine learning</b> systems capable of generating text, images, code, or other types of content, often in response to a prompt.</p> <ul style="list-style-type: none"><li>▶ Automatically process a range of time-consuming language-based tasks normally fulfilled by humans</li><li>▶ Machine learning algorithms to “predict” or generate results</li><li>▶ Ability to gather, maintain, and analyze large amounts of data, using both human and AI tools, to arrive at the best decisions</li></ul>
<p><b>Difficulty:</b> Low/Citizen-led <b>Time to Value:</b> 1- 2 months <b>Cost:</b> Low</p>	<p><b>Difficulty:</b> Low/Citizen-led <b>Time to Value:</b> 1-2 months <b>Cost:</b> Low</p>	<p><b>Difficulty:</b> High/IT dependent <b>Time to Value:</b> 3-6 months <b>Cost:</b> High</p>	<p><b>Difficulty:</b> Medium/IT dependent <b>Time to Value:</b> 2-3 months <b>Cost:</b> Medium</p>



# Evolving Internal Audit Through Innovation

## GOALS AND OBJECTIVES

- ▶ Create culture of continuous improvement and transformation (CI, CT) for Audits, business processes and enterprise Initiatives
- ▶ Establish goals for the consistent use of digital tools and KPIs
- ▶ Establish a rating system to easily communicate impact and findings
- ▶ Roll out framework for evaluating audits that can be tech-enabled



## KEY VALUE INDICATORS

- ▶ Expected savings resulting from the use of digital tools
- ▶ Average loaded cost per audit, average days from plan to final report
- ▶ Estimated versus actual days per audit
- ▶ Cost to develop digital tools to support audits and advisory projects
- ▶ Number of digital tools and value created



## DIGITAL SOLUTIONS FOR INTERNAL AUDIT

- ▶ Risk assessment, risk scoping, and planning
- ▶ Audit automation & analytics: audit execution
- ▶ Evaluation & aggregation of
- ▶ Audit: control deficiencies

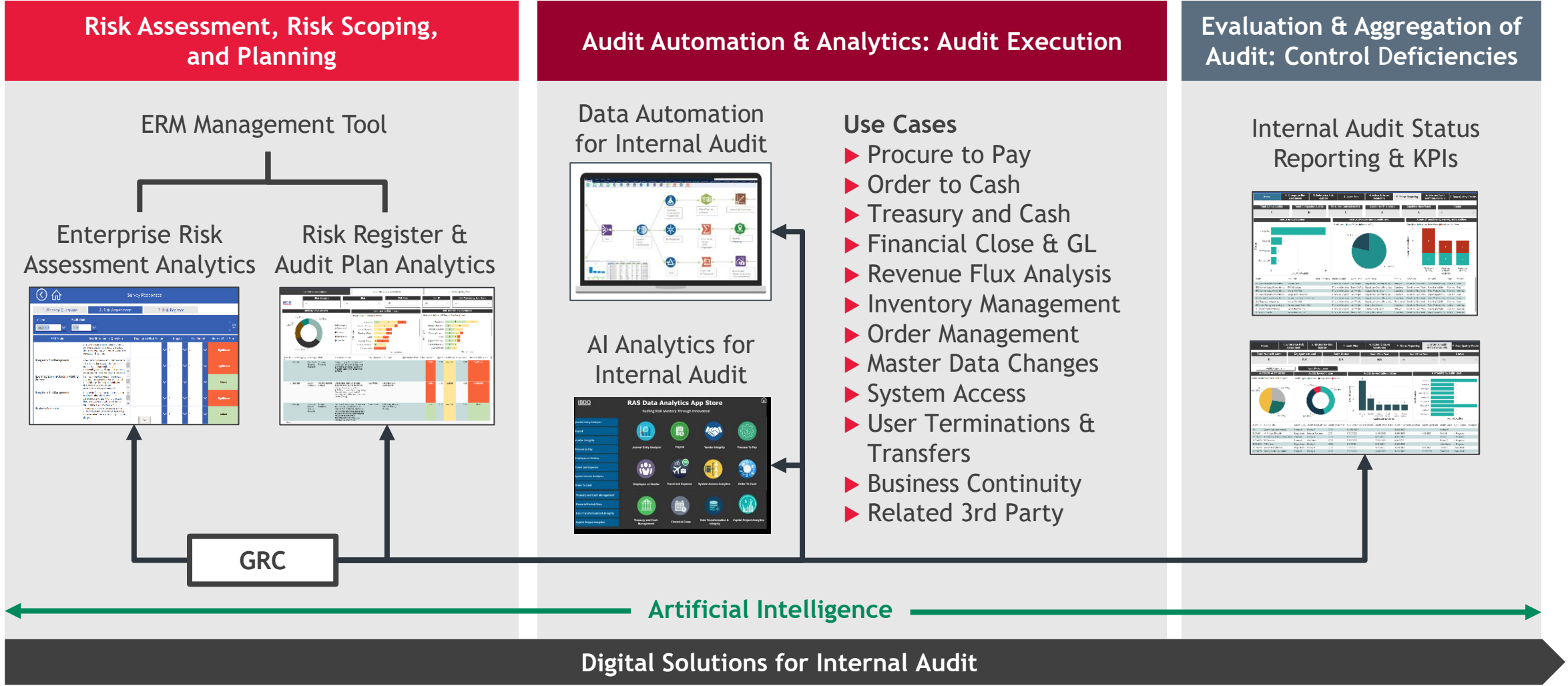


## VALUE FOR ENTERPRISE

- ▶ Increase risk coverage
- ▶ Drive down cost of compliance
- ▶ Gain process efficiencies
- ▶ Continuous Monitoring
- ▶ Access to data driven risk insights

# Digital Solutions for Internal Audit

Digital Tools for Internal Audit



# Use Cases for NextGen Technology and Analytics for Internal Audit



# The Internal Audit Lifecycle



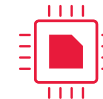
## TECHNOLOGY ENABLERS



Advanced Analytics



Process Intelligence



Robotics



Artificial Intelligence (AI)

- ▶ Training and Skill Development using ChatGPT
- ▶ Continuous Learning & Knowledge Sharing using ChatGPT
- ▶ Control Rationalization and Automation Assessment
- ▶ Digital Maturity Assessment

- ▶ Predictive Analytics
- ▶ Automated Data testing
- ▶ 100% coverage
- ▶ Control validation
- ▶ ChatBots for Auditors
- ▶ AI-enabled Fraud Detection
- ▶ Risk-based Sampling



- ▶ Risk Assessments using AI and ChatGPT
- ▶ Interactive Risk Register
- ▶ Audit Planning & Resource Allocation

- ▶ Automated Audit reports
- ▶ Interactive Status Dashboards and Reporting
- ▶ Continuous Monitoring of Compliance metrics

## USE CASE #1

# Enterprise Risk Assessment Project

**Hi, I am Emma Jones. I am the Internal Audit Director for a Renewable Energy company.**

- ▶ My team has to perform our annual enterprise risk assessment within a very tight budget and deadline.
- ▶ Our process is very manual, and we are looking for ways to gain efficiencies this year.
- ▶ We had a team meeting to discuss options and came up with the following questions:
  - Is there a more efficient way to collect risk data?
  - How can we identify new or emerging risks in our industry?
  - Are there standard interview questions for targeted risk stakeholders?
  - What templates or information can we leverage?
  - Summarizing results is so time consuming, what tools can help us?
- ▶ How can AI and digital tools help my team gain efficiencies with the risk assessment process this year?



# Digital Approach for Emma's Enterprise Risk Assessment

## Risk Assessment Planning

- ▶ Open AI and ChatGPT can be used to benchmark new and emerging risks in her industry
- ▶ Standard Questionnaire templates per stakeholder available to team

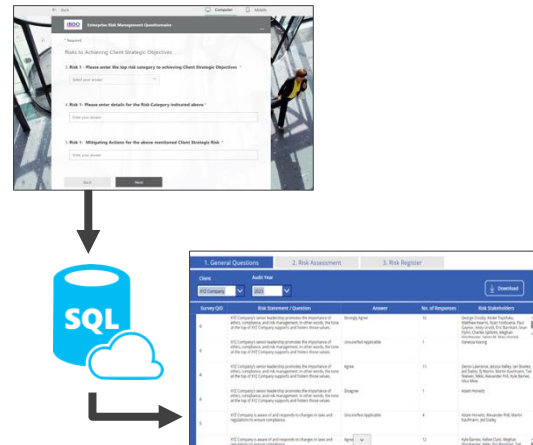
What new and emerging risks should I consider for a renewable energy company?

**ChatGPT**  
As a renewable energy company, while you're poised to benefit from the transition to sustainable energy sources, there are still several emerging risks you should consider:

- Policy and Regulatory Changes:** Shifts in government policies and regulations can impact the renewable energy sector significantly. Changes in subsidies, tax incentives, or renewable energy targets can affect project economics and market demand.
- Market Competition:** Increasing competition from traditional energy sources or other renewable energy companies can affect your market share and profitability. Additionally, technological advancements or breakthroughs in energy storage could disrupt existing market dynamics.
- Supply Chain Disruptions:** Dependence on rare earth minerals, critical components, or specific geographic regions for sourcing materials could expose your company to supply chain disruptions due to geopolitical tensions, trade disputes, or natural disasters.
- Technological Risks:** Emerging technologies such as advanced energy storage, grid integration, or innovative renewable energy solutions could render existing technologies obsolete or less competitive. Investing in R&D and staying updated with technological advancements is crucial to mitigate this risk.
- Cybersecurity Threats:** With the increasing digitization and interconnectedness of energy systems, cybersecurity threats such as hacking, data breaches, or ransomware attacks pose significant risks to the reliability and security of renewable energy infrastructure.

## Gathering Risk Data

- ▶ Web-based surveys distributed to obtain risk ratings
- ▶ Digital tools are used to summarize and calculate risk ratings for impact and likelihood based on results from surveys



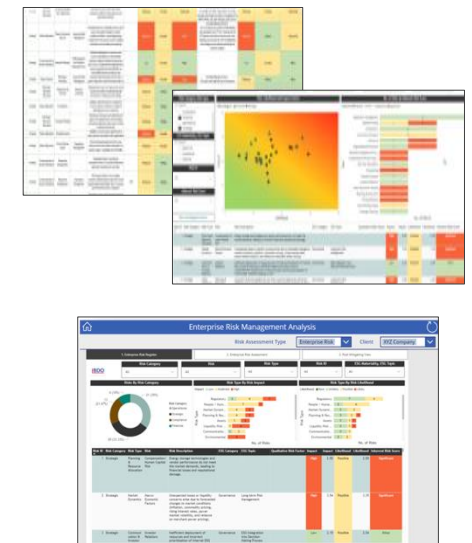
## Assessing Risks

- ▶ Review initial assessment based on the qualitative and quantitative factors
- ▶ Generate a draft risk register with inherent risks based on the risk data collected
- ▶ Add mitigating controls for residual risk score

Client	Audit Year	Risk ID	Risk Type	Risk Statement / Question	Qualitative Risk Factor	Impact	Likelihood	Inherent Risk Score	Mitigating Controls
EMC	2024	R001	Operational	Dependence on rare earth minerals for critical components of renewable energy systems.	High	Significant	Possible	Major	1. Diversify sourcing regions for critical components. 2. Establish strategic partnerships with suppliers. 3. Invest in R&D for alternative materials.
EMC	2024	R002	Regulatory	Changes in government policies and regulations affecting renewable energy incentives.	Medium	Significant	Possible	Substantial	1. Monitor regulatory updates. 2. Engage with industry associations. 3. Diversify revenue streams.
EMC	2024	R003	Technological	Emerging technologies rendering existing renewable energy solutions obsolete.	Low	Significant	Possible	Minor	1. Invest in R&D. 2. Stay updated with technological advancements. 3. Form strategic alliances.

## Deliver Results & Reporting

- ▶ Power BI dashboards for reporting to enable team to drill down into insights and reporting to upper management and audit committee



# Risk Based Sampling Approach for Analytics



## USE CASE #2

# Tech-Enabling Internal Audits

**Hello, I am Amber, a VP of Internal Audit for Global Comp, Inc.**

- ▶ Our Internal Audit field work continues to be time-consuming and very manual.
- ▶ Our team of Internal Auditors is small, supporting multiple international locations and entities.
- ▶ Typical audits take anywhere from 2-3 months to complete so weaknesses and errors can go undetected for long periods of time.
- ▶ Our audit sampling methods do not give us a representative sample of the population.
- ▶ Data volume is large, and our teams have difficulty identifying high-risk transactions.
- ▶ Recently, leadership has asked us to cut costs while the number of risks have increased, requiring more time needed for internal audit services.
- ▶ How can AI or digital tools be used to reduce time and tech-enable the execution of Internal Audits?





# Digital Approach to Tech-Enable Amber's IA Function



## ANALYZE

- ▶ Analyze Audit Plan
- ▶ Identify Audits as good candidates for Automation and Analytics
- ▶ Determine what accelerators and pre-built solutions can be used to tech-enable Audits



## DATA TRANSFORMATION

- ▶ Using Alteryx Designer, extract and transform data from source systems
- ▶ Perform data validation and completeness automation testing
- ▶ Automate data mapping to common data model
- ▶ Perform automation testing for select audits



## BUILD

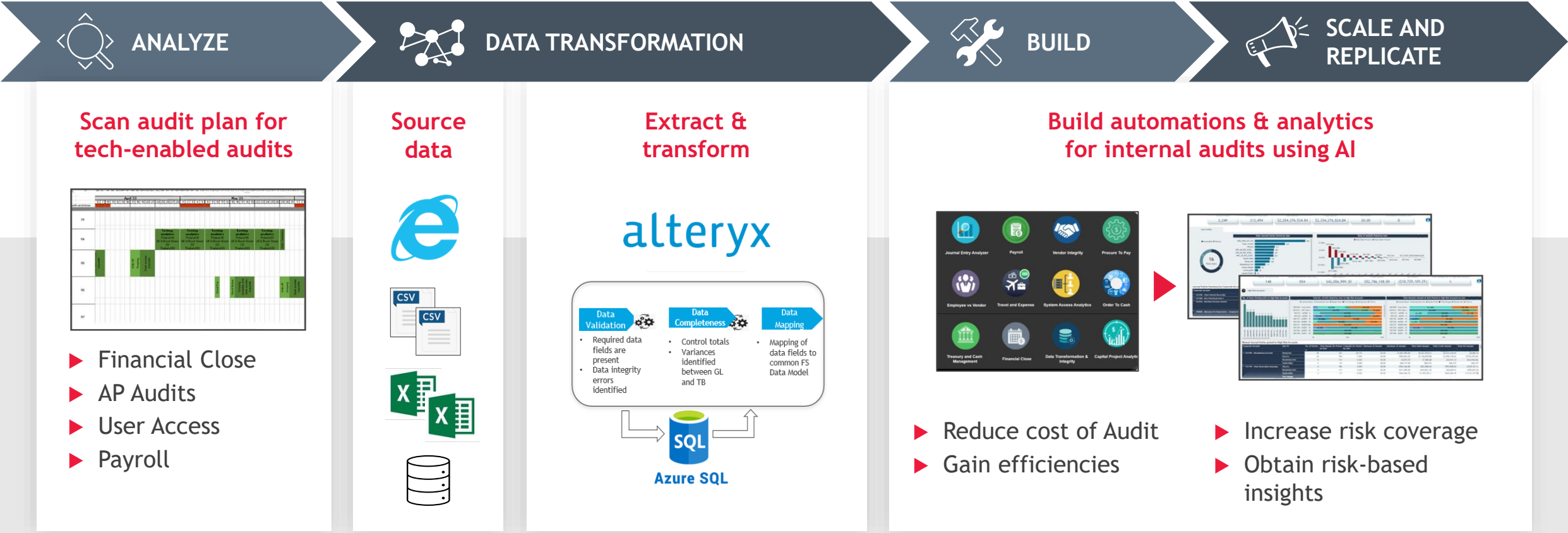
- ▶ Define Audit Scope and Key Risk Indicators
- ▶ Assess data complexity and formatting
- ▶ Develop automations to ingest and format data
- ▶ Using AI to build Analytics based on KRIs and predictive analysis modeling
- ▶ Risk rank transactions to enable risk-based sampling



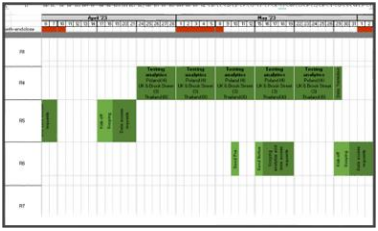
## SCALE AND REPLICATE

- ▶ Build analytics and automations for other Audits
- ▶ Gain efficiencies and improve risk coverage
- ▶ Continuous Monitoring
- ▶ Automated Testing
- ▶ Reduce cost of Audit

# Digital Approach to Tech-Enable Amber's IA Function



## Scan audit plan for tech-enabled audits

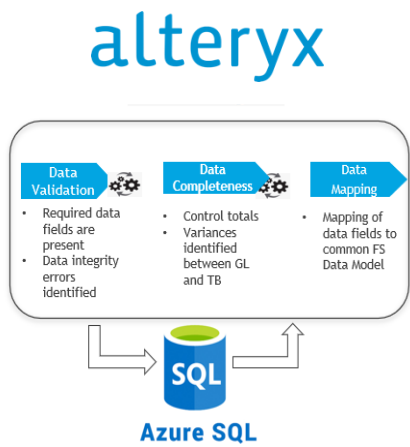


- ▶ Financial Close
- ▶ AP Audits
- ▶ User Access
- ▶ Payroll

## Source data



## Extract & transform



## Build automations & analytics for internal audits using AI



- ▶ Reduce cost of Audit
- ▶ Gain efficiencies
- ▶ Increase risk coverage
- ▶ Obtain risk-based insights

# NextGen Risk-Based Analytics for Internal Audit



## USE CASE #3

# ChatGPT for Internal Audit

**Hi, I am Carl Wilson, the Chief Audit Executive for a large manufacturing firm. We are based in 125 countries with over 7,000 offices and 150,000 employees.**

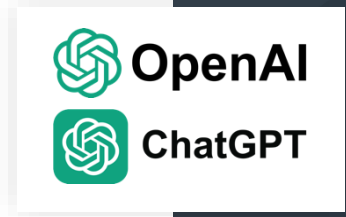
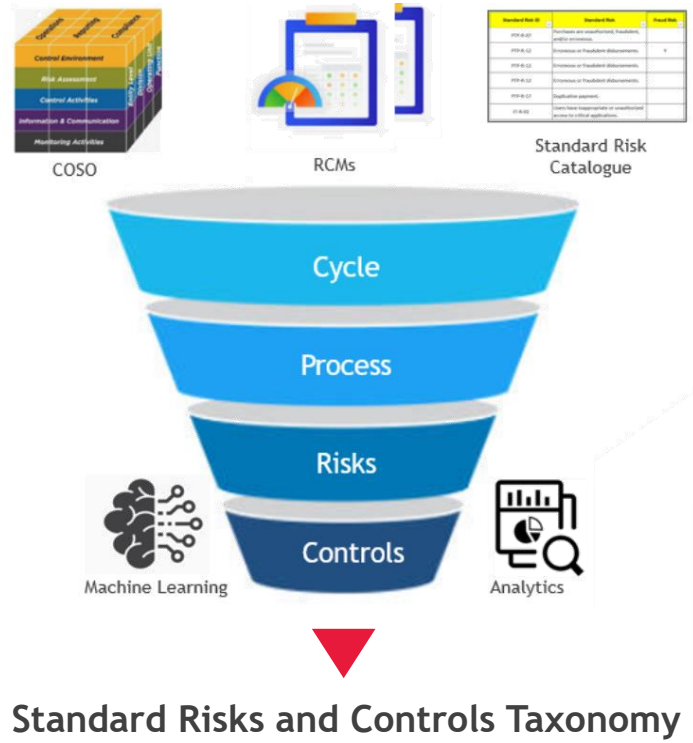
- ▶ My team doesn't have a complete list of Key Risk Indicators by business process and Audit area
- ▶ Often, our teams perform audit testing procedures for similar Audits in an inconsistent and manual way
- ▶ I have been assigned the task of enhancing our controls environment by finding ways to implement more preventative vs detective controls
- ▶ I have also been asked to find more opportunities to replace manual controls and procedures with more automated controls
- ▶ I have a small team of auditors that must support several audits globally
- ▶ How can I leverage Artificial Intelligence and ChatGPT?



# ChatGPT for Control Rationalization and Automation

Standard Risks and Controls Library

Web Content



What are some preventative controls I can implement in my Procure to Pay cycle?

What SOX controls should be automated for Procure to Pay?

What controls should I consider for the Journal Entry process?

# ChatGPT Results

(1 OF 2)



## What are Key Risk Indicators for Financial Reporting Process?

The screenshot displays the Chat BDO interface. At the top left is the BDO logo and 'Chat BDO'. At the top right, it says 'Hello, Shana Mcgee!' and 'Log out'. A prominent orange banner at the top contains a warning: 'AI generated content may contain inaccurate or outdated information. The current version of Chat BDO was not trained on and is not aware of events and updates after 2021, so particular care must be used with any outputs to bring them current. You are responsible for the accuracy and appropriateness of content you use from this assistant. Conversations in Chat BDO are logged for 180 days and may be monitored for quality improvement and abuse.'

On the left is a dark sidebar with a '+ New Chat' button and a list of chat topics under 'Today' and 'Previous 7 Days'. The main area shows a grid of chat results:

- Otto Experiment**: Persona to use documents for Otto experiment - contacts: Matthew Emge. Includes a 'Details...' button.
- Otto Sampling Experiment**: Persona to use Sampling documents for Otto experiment - contacts: Matthew Emge. Includes a 'Details...' button.
- Otto Workspace Check Experiment**: Persona to use Workspace Check documents for Otto experiment - contacts: Matthew Emge. Includes a 'Details...' button.
- Programming Assistant**: Programming Assistant serves as your trusted companion for streamlined development in languages like C#, Excel formulas, DAX code, and more. This intelligent assistant offers real-time suggestions, code optimizations, and comprehensive documentation to help you write your code. **May have inaccuracies.** Includes a 'Details...' button.
- RAS - Internal Audit Reporting**: Includes a 'Details...' button.
- RAS - Key Risk Indicators**: Provides access to a library of key risk indicators to be considered for GL/Manual J/E and Procure to Pay Audit areas. Includes a 'Details...' button.
- RAS - SOX Risks & Controls Library**: Includes a 'Details...' button.
- TEMP Board Meeting Minutes**: Temporary persona for testing system prompts while using embeddings for board meeting minutes experiment. Includes a 'Details...' button.

At the bottom, there is a 'Type your message' input field and a red send button with a white arrow.

# ChatGPT Results

(2 OF 2)



What preventative and automated system controls should I consider in the Procure to Pay process?

The screenshot shows the Chat BDO interface. At the top left is the BDO logo and 'Chat BDO'. At the top right, it says 'Hello, Shana Mcgee!' and 'Log out'. Below the header is a red bar with '+ New Chat' and a warning message: 'AI generated content may contain inaccurate or outdated information. The current version of Chat BDO was not trained on and is not aware of events and updates after 2021, so particular care must be used with any outputs to bring them current. You are responsible for the accuracy and appropriateness of content you use from this assistant. Conversations in Chat BDO are logged for 180 days and may be monitored for quality improvement and abuse.' The left sidebar shows chat history for 'Today' and 'Yesterday', with entries like 'Procure-Pay Controls', 'Procure-to-Pay Optimization', 'Financial Reporting Risks', 'New chat', 'Pay Cycle Controls', 'Purchase Requisition Risks', and 'Financial Risk KRIs'. The main area displays several AI-generated content cards, each with a 'Details...' button. The cards include: 'Programming Assistant' (describing a tool for code development), 'RAS - Internal Audit Reporting' (describing report templates), 'RAS - Key Risk Indicators' (describing a library of risk indicators), 'RAS - SOX Risks & Controls Library' (describing standard risks and controls), and 'TEMP Board Meeting Minutes' (describing prompts for meeting minutes). A 'Type your message' input field is at the bottom.

# Internal Auditor's Approach for Auditing GenAI



## 1. Research and Assess

- ▶ Review policies and procedures that reference AI
- ▶ Research how AI is planned to be used within the organization
- ▶ Understand the current or planned governance process for AI
- ▶ Identify data sources used by Gen AI (public, private)
- ▶ Assess data security and user provisioning

## 2. Adopt an AI Auditing Framework

- ▶ Review AI Auditing reference material (e.g. IBM's AI Gov eBook, GTAGs, NCCG for Secure AI) and choose a framework (e.g. NIST AI RMF, IIA AI Auditing Framework)
- ▶ Consider the following areas to focus on:
  - Risk Assessment -> Governance -> Data Integrity -> AI Model Validation -> Transparency -> Operational Controls -> Ethics -> Performance -> Regulation -> Stakeholder Communications

## 3. Perform a GenAI Audit

- ▶ Divide the Audit it in two phases:
  - Phase 1: Discovery and Risk Assessment | Outcome: Clarity on AI use, maturity and risk
  - Phase 2: Testing of AI procedures and controls | Outcome: Validation of AI governance, risks and controls

## RELEVANT THOUGHT LEADERSHIP AND INSIGHTS

Below is a selection of relevant thought leadership articles and insights that focus on data analytics and automation:

- ▶ [The Internal Auditor's Artificial Intelligence Strategy Playbook](#)
- ▶ [Internal Audit of the Future](#)
- ▶ [Optimizing the Internal Audit Process for Greater Efficiency](#)

## RISK CONSIDERATIONS

- ▶ Bias and Discrimination
- ▶ Responsibility and Accountability
- ▶ Privacy and Data Security
- ▶ Harmful Content & Hallucination
- ▶ Copyright and Intellectual Property
- ▶ Misinformation and Disinformation



# Final Thoughts & Takeaways



Analytics and other digital tools must be embedded in lock step with the overall Audit Strategy to drive adoption



Start your digital transformation journey in Internal Audit by pursuing quick wins



Consider the risks of GenAI from the onset and adopt an AI auditing framework

Questions?



# Thank You!



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Join Us!

# Gatekeepers and the SEC: Are Internal Audit Leaders at Risk?

TUESDAY, APRIL 23, 2024

3:00 – 4:00 PM ET / 2:00 – 3:00 PM CST

[SIGN UP TODAY ►](#)



Join Us!

# From AI to IA: How Internal Audit Can Adopt and Address the Risk of Artificial Intelligence

TUESDAY, JUNE 25, 2024

3:00 – 4:00 PM ET / 2:00 – 3:00 PM CST

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Join Us!

# ESG Reporting: How to Navigate the Evolving ESG Regulatory Landscape and the Role of Internal Audit

TUESDAY, SEPTEMBER 24, 2023  
3:00 – 4:00 PM ET / 2:00 – 3:00 PM CST

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# Skills Development: Project Management for Internal Audit

TUESDAY, DECEMBER 3, 2024

3:00 – 4:00 PM ET / 2:00 – 3:00 PM CST

[SIGN UP TODAY ▶](#)



A modern office interior featuring a staircase with a glass railing, a reception desk with the BDO logo, and large windows overlooking a city skyline. The scene is dimly lit, suggesting an evening or night setting.

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