



# Applying Emerging Technologies in Audits

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# Use of custom analytics in audits

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- ▶ Audit procedures can include the use of standardized firm-sponsored analytics tools which go through rigorous user acceptance testing prior to being used in audits.
- ▶ Audits can also make use of custom analytics and automation, developed either by a central automation group or the audit team themselves and used only for one audit.
- ▶ Custom analytics and automation can use standard software, such as MS Excel macros, MS Access, Power BI, Power Automate, Tableau, or Alteryx, or they can be custom programs developed using languages such as Python or Java.

# Assessment of custom analytic and automated techniques

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1. Determine the objectives of the custom analytic or automated technique.
2. Design the custom analytic or automated technique.
3. Perform testing to verify that the custom solution delivers the output as intended.
4. Understand how changes affect the custom analytic or automated techniques.

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- ▶ Document the data flows and calculations of the custom solution including:
  - ▶ Flowchart or narrative description of the functionality of the system
  - ▶ Processing steps, including data transformations and calculations
  - ▶ Documentation of any assumptions
- ▶ Testing
  - ▶ Quality assurance testing
  - ▶ Agree total record count and financial totals from the input files to the output
  - ▶ For solutions with complex calculations, re-perform calculations in Excel for a sample of test transactions
  - ▶ Test edge cases and incorrect entries (e.g. text in a numerical field, negative numbers, zero balances, balances >1 billion)

# Auditing of machine learning/artificial intelligence algorithms

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- ▶ Types of models
  - ▶ Supervised vs unsupervised learning
  - ▶ Predictive models
  - ▶ Classification models
  - ▶ Anomaly detection models
- ▶ Data risk
  - ▶ Unbiased and resilient
- ▶ Algorithm risk
  - ▶ Explainable
  - ▶ Interpretability
  - ▶ Model validation
- ▶ Audit approaches
  - ▶ Validation of inputs and outputs
  - ▶ Testing of controls around model development and validation

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