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# Audit Data Analytics

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# Audit data analytics: Agenda

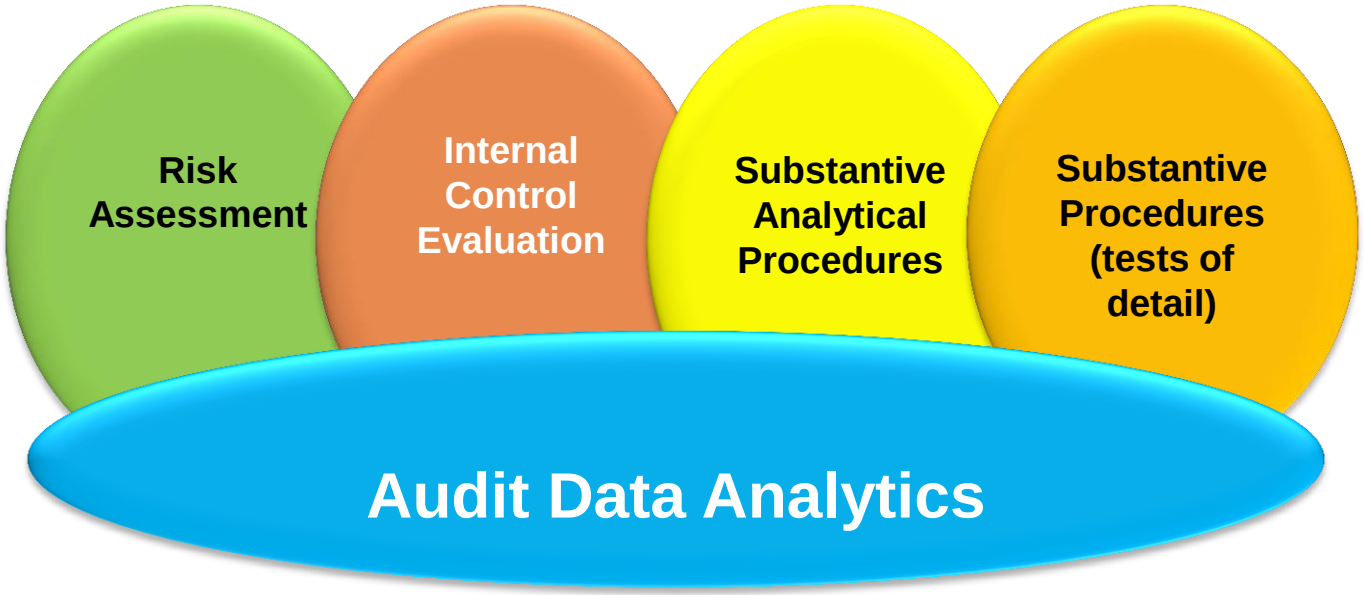
## RADAR

- Multidimensional audit data selection
- Process mining
- Visualization as audit evidence

## The future

- What could the future hold?
- Other key questions

# Audit data analytics – a technique, not a tool



# RADAR

Rutgers AICPA Data Analytics Research Initiative

# The RADAR project

Rutgers, AICPA, CPA Canada, and 8 largest firms

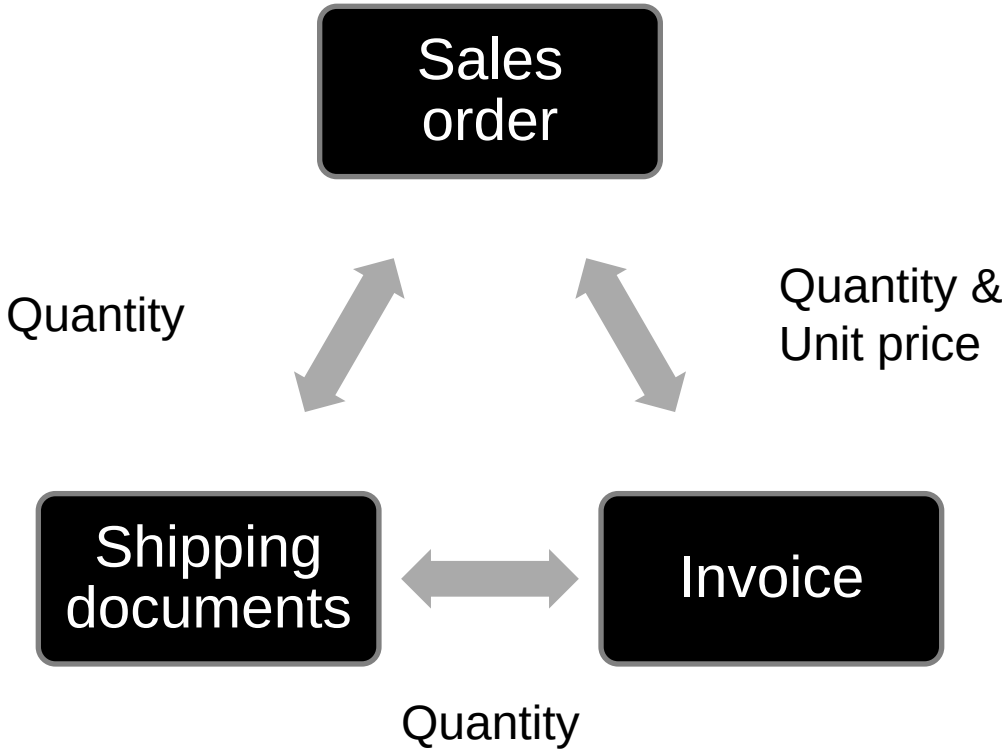
Started officially in June 2016

3 projects currently

- Multidimensional audit data selection(MADS)
  - AKA “exceptional exceptions
  - Revenue three-way match illustration
- Process mining
- Visualization as audit evidence

# MADS data analytics illustration: revenue three-way match

Objective: obtain audit evidence over the existence and accuracy of revenue



# MADS data analytics illustration: revenue three-way match

Entity ABC has revenue of €125 million generated by 725,000 transactions. The three-way match procedure is executed with the following results:

| | Amount (€) | % | Number of transactions | % |
|---|---|---|---|---|
| No differences | 119,750,000 | 95.8 | 691,000 | 95.3 |
| Outliers: | | | | |
| Quantity differences | 3,125,000 | 2.5 | 16,700 | 2.3 |
| Pricing differences | 2,125,000 | 1.7 | 17,300 | 2.4 |

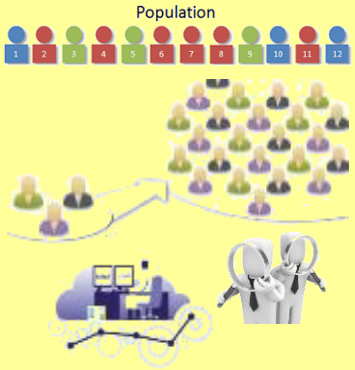
Note: Materiality for the audit of the financial statements as a whole is €1,000,000.

# Multidimensional Audit Data Selection (MADS)

**Traditional sampling approach**


**Advances in data processing ability & data analytic techniques allows auditors to evaluate the entire population instead of examining just a chosen sample.**

**New approach**




- **BUT, often generate large numbers of outliers.**
- **Impractical for auditors to investigate all outliers**

- **Crucial to develop a method that can help auditors effectively deal with massive amounts of data, but also assist them to efficiently handle a large number of outliers**

**MADS**

**Whole transaction data (Entire population)**

**Auditors' judgment-based filters – 3-way match procedure**

**Notable Items**

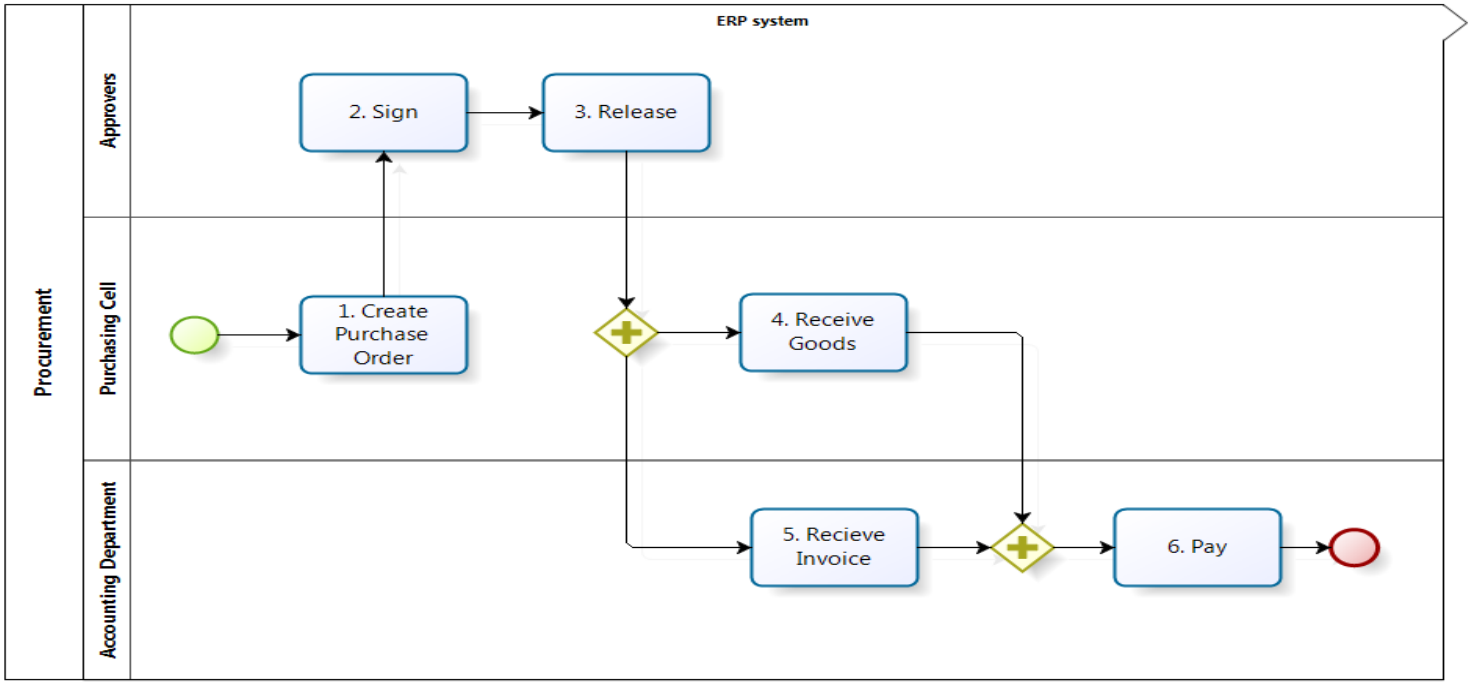
**Outlier detection techniques – additional filters**

**Exceptions**

**Prioritization**

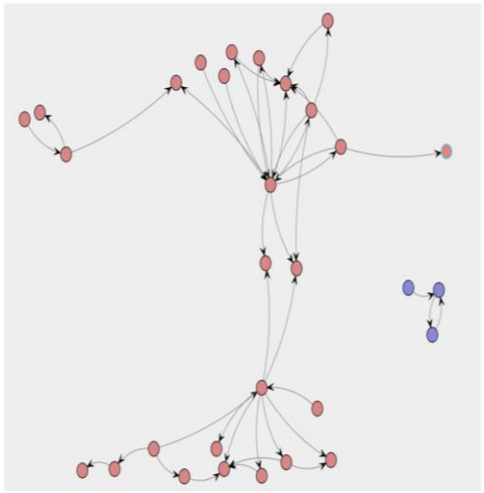
**Prioritized exceptions**

# Analytics for internal control evaluation through **process mining**

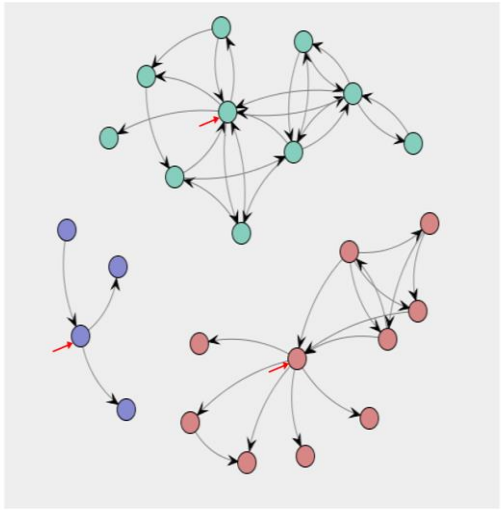


# Analytics for internal control evaluation through **process mining**

Social Network of the 742 Cases Without *Sign* and in Violation of SOD Controls



Social Network of 175 cases by three individuals violating SOD



# Visualization as audit evidence

**Objective:** Demonstrate/illustrate that visualization can be used as audit evidence

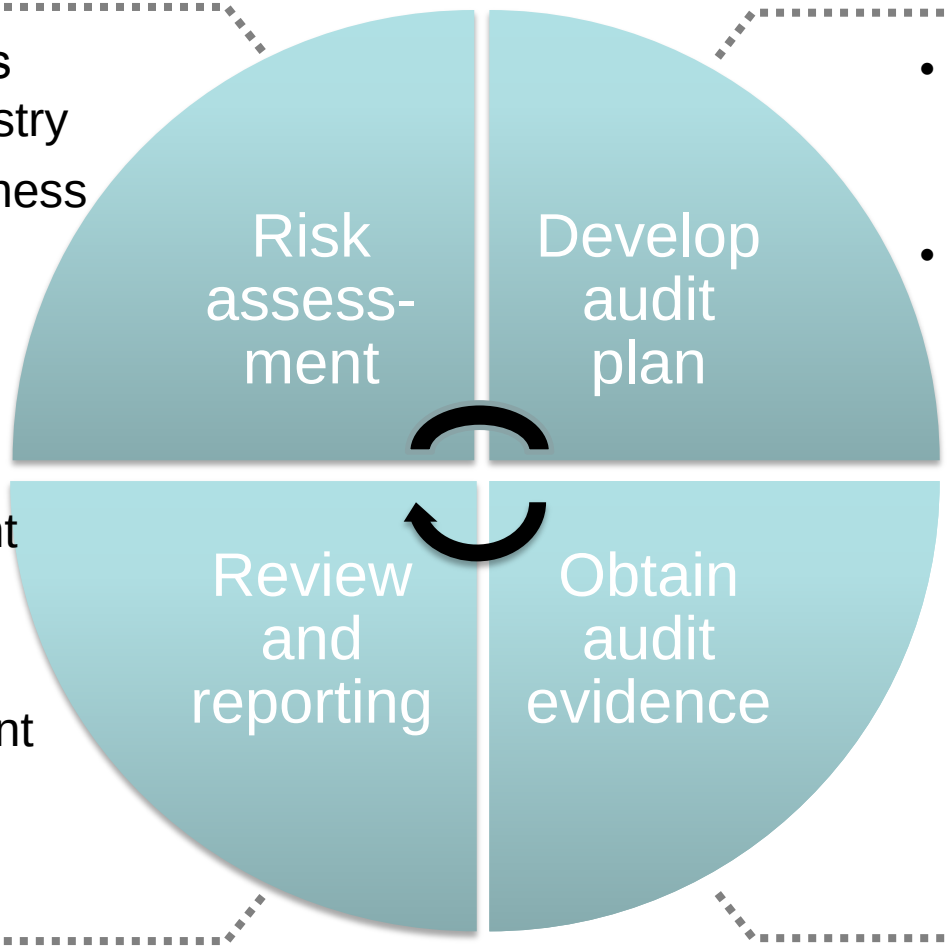
**The nature of the research:** Demonstration, illustration, proof

**Desired outcome:** Various types of visualizations generated from exploratory and confirmatory data analysis of a dataset that can be used in external audit

**How that outcome will serve to prove (or disprove) the hypothesis:** Assess the sufficiency, relevance, and reliability of generated visualizations as audit evidence

# Visualization in the audit process

- Understand client's business and industry
- Assess client business risk
- Risk assessment analytics

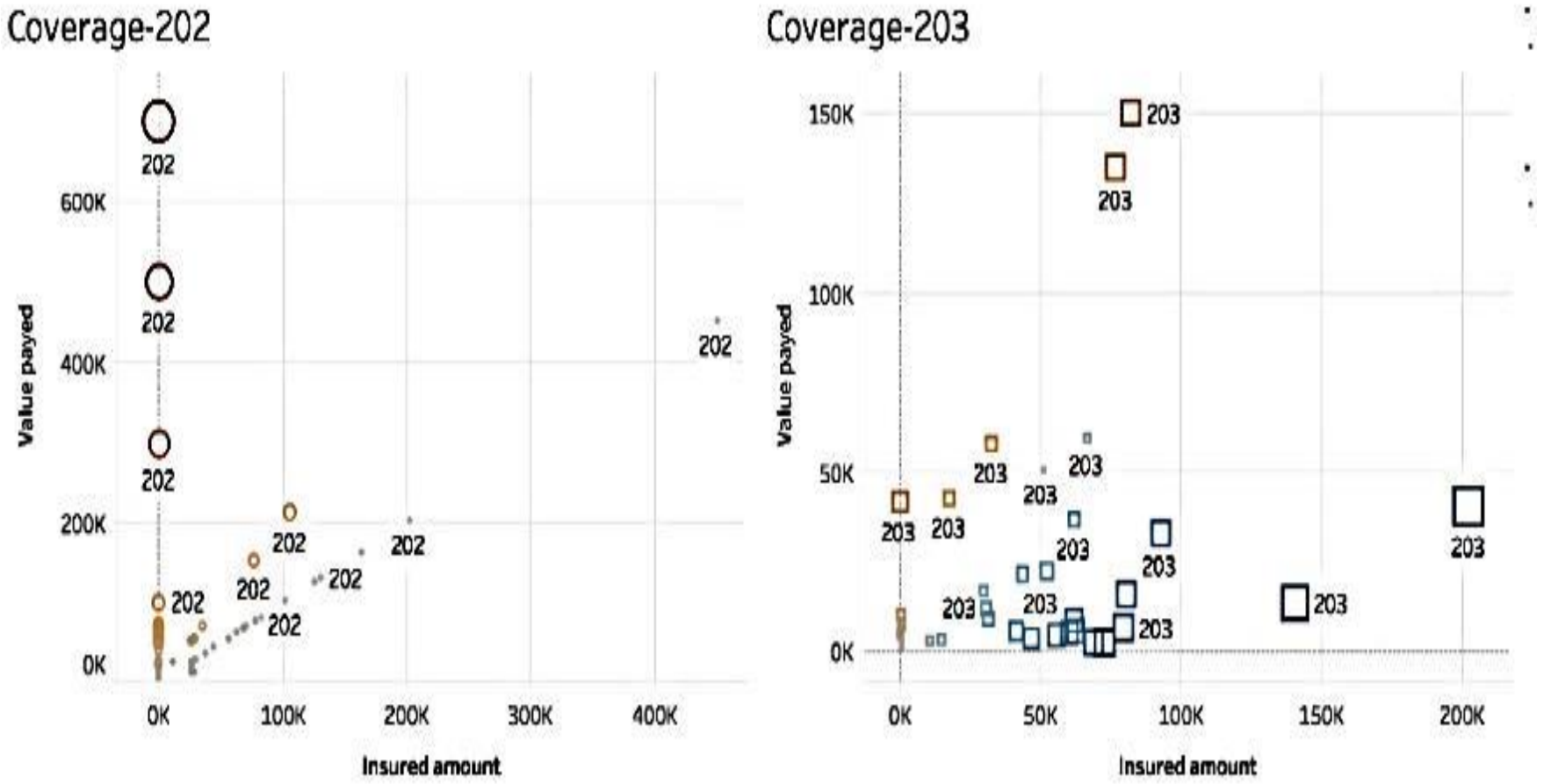



- Understand internal control and assess control risk
- Assess fraud risks

- Review subsequent events
- Issue audit report
- Assess engagement quality

- Substantive tests of transactions
- Perform analytical procedures
- Test of details of balances

Dashboard: investigate the relationship between insured amount and actual payment amount by different coverage codes for the individual claims



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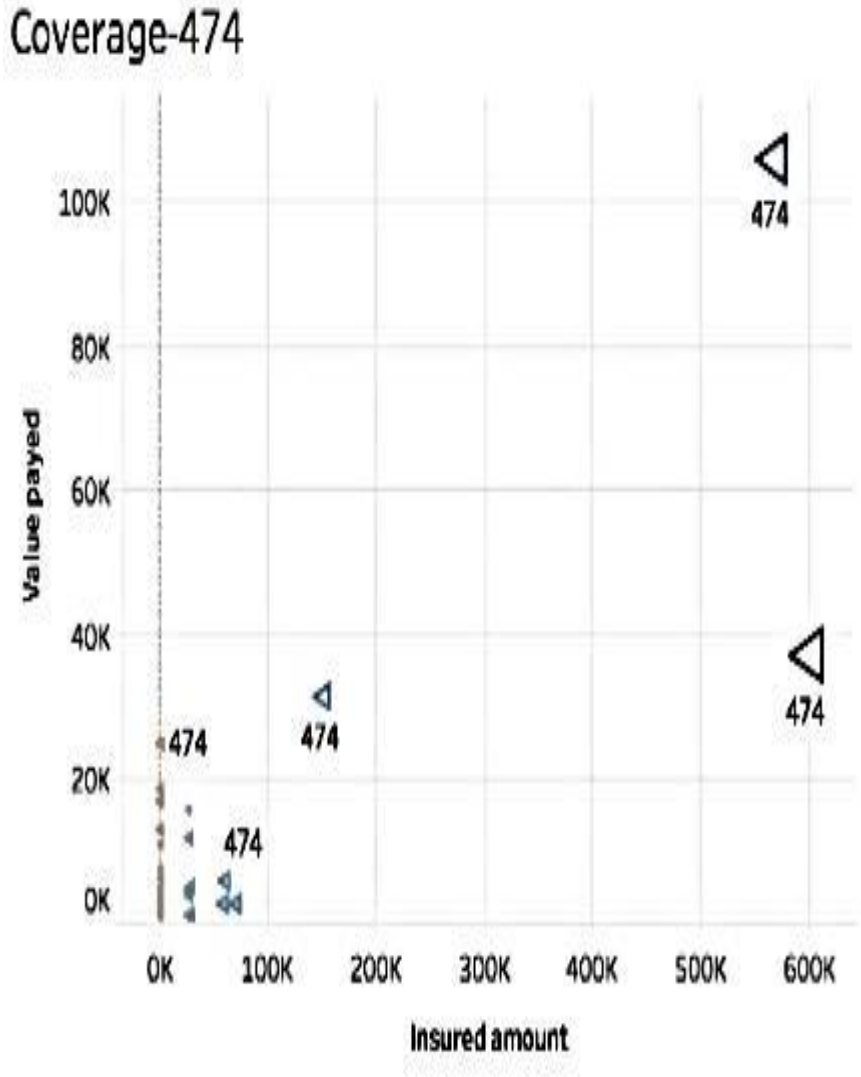


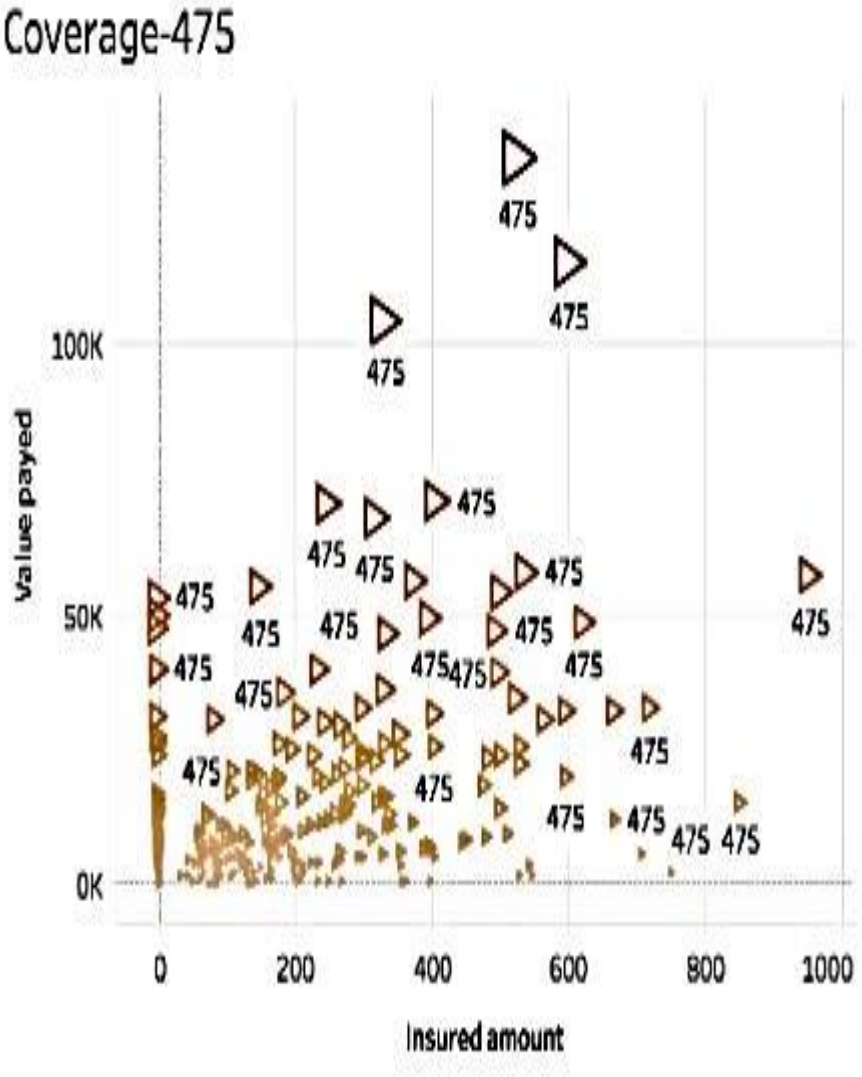

# THE FUTURE

# What could the future hold?

- Continuous control monitoring – formalization of controls evaluation
- Continuity equations – structural modeling in continuous auditing
- Evidence from big data – electronic logs everywhere
- Audit data standards – normalizing data to facilitate analytic applications
- Distributed ledger technology, Blockchain
- Machine learning/cognitive computing

# Other key questions

- Where in the audit of historical financial statements are these methods to be used?
- How to create an experimentation period where supervised analytics projects are performed in real engagements?
- How to deal with the economic limitations of using data analytic methods in audits?
- How can human competencies be created?
- How can device competencies be created?
- How will data analytics impact regulatory approaches and auditing standards?

**Thanks!!**

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**http://raw.rutgers.edu**

# Resource:
# Audit data analytics free on YouTube from the Rutgers curriculum

1. Introduction to audit analytics:

https://www.youtube.com/playlist?list=PLauepKFT6DK8nsUG3EXi6lYVX0CPHUngj

2. Special topics in audit analytics:

https://www.youtube.com/playlist?list=PLauepKFT6DK-PpuseJtSMlIy-YBhaV4TH

3. Information risk management:

https://www.youtube.com/playlist?list=PLauepKFT6DK8uxePhPCoHjDf8_DlhRtGS

4. Tutorials for risk management:

https://www.youtube.com/playlist?list=PLauepKFT6DK9Grq8J67NMyGpYh1AsBb--

For more information please visit:

http://raw.rutgers.edu/accounting-courses.html