Slide 1

Getting Started with Data Analytics

visual risk IQ.
See. Analyze. Act

Prepared for the UCOP Auditor's Symposium
January 30, 2013 and February 14, 2013

Slide 2

Session Objectives

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- Higher Education Headlines
- New IIA Guidance
- Visual Risk IQ's QuickStart[sm] Methodology
- Group Exercise - let's develop a test plan
- Continuous Controls Monitoring – the evolution of Data Analytics
- Q&A
- Additional resources

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Slide 3

Higher Education Headlines

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Longtime LaSalle employee fired in alleged fraud

What do we want to be famous for?

Tech Professor Arrested In $2M Racketeering Scheme

ATLANTA — A star professor at Georgia Tech and two other employees were accused of the Fulton County Jail to face $2 million racketeering charges on Friday. Channel 2 Action News had the only cameras rolling as microchip professor Joy Laskar, research engineer Stephane Pinel and office administrator Chris Evans were arrested.

Professor Accused Of Stealing $2M From Ga. Tech

Laskar and his team were behind a microchip breakthrough that his lawyer said is potentially worth millions of dollars. But their inventions were put under the microscope when internal auditors spotted strange financial transfers to a microchip company partly owned by Laskar.

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Current Fraud Statistics from the ACFE (source: ACFE Report to the Nations)

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- Median loss $140,000 - these losses are grossly understated as they do not include investigative costs, fines, and penalties.

- 20% of reported cases involved a loss of $1 million or more

- Median time before discovery: 18 months

- Organizations with anti-fraud controls correlated with significant decreases in cost and duration of fraud

- Internal Audit detects 14% of frauds. More than external audit (3%), but lagging tips and management review

Source: Association of Certified Fraud Examiners (ACFE) 2012 "Report to the Nations on Occupational Fraud and Abuse"

How does the economic environment affect fraud risk?

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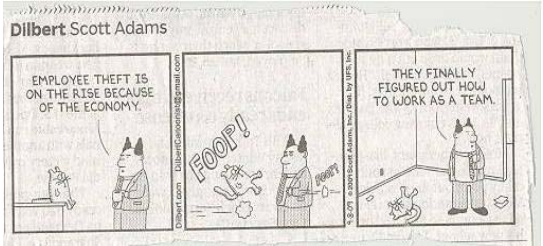
- Think about the Fraud Triangle
- Financial Pressure, even Rationalization are increasing
- What is the Audit Profession doing about Opportunity

IIA GTAG #13 - Fraud Prevention and Detection in an Automated World

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- Reiterates IIA Professional Standards
  - 2120.A2 – The internal audit activity must evaluate the potential for the occurrence of fraud and the manner in which the organization manages fraud risk
  - The internal auditors must consider the probability of significant errors, fraud, non-compliance, and other exposures when developing the engagement objectives.

- Advocates use of technology
  - Provides examples of fraud schemes and data analysis tests that are designed to identify each schemes.
  - No endorsement of a specific software product
  - Analysis tools for structured and unstructured data

IIA GTAG #16
Data Analysis Technologies

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- Emphasizes importance of data analysis
  - Business case for increased assurance
  - Improvements in control and also risk assessment
  - Improved auditor efficiency and effectiveness

- Provides implementation guidance
  - Consider Key Performance Indicators and Metrics
  - Also consider mean, variance, and outliers
  - Patterns, including digital analysis / Benford's Law
  - Introduces Data Analysis Maturity Model
  - Methodology is plan, prepare, test, review

GTAG
GLOBAL TECHNOLOGY AUDIT GUIDE
IPPF – Practice Guide
Data Analysis Technologies
IIA

"Internal auditors who don't use data mining and analytics should get on their horse & buggy and go home" @IIACEO

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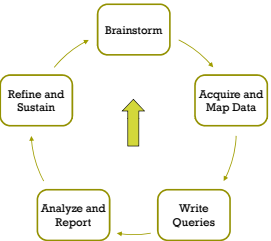© 2013 Visual Risk IQ, LLC, All Rights Reserved

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QuickStart[sm] Methodology
Begin with Brainstorming

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Brainstorm

Refine and Sustain → Brainstorm → Acquire and Map Data → Write Queries → Analyze and Report → Refine and Sustain

Brainstorm

- Review Audit Objectives
- Explore Internal Data Sources
- Compare with External Data Sources
- Consider together with other Audit Tests
- Use Metrics, Statistics, Exception Queries

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Data Analytics is the Connect between thoughtful Questions, and (Digital) Data

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- What business or control questions would you like to answer? Why?

- How would you identify the answer today?

- Would knowing the answer in greater depth be useful?

- What about knowing the answer more often (i.e. greater frequency)

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QuickStart℠ Methodology
Acquire and Map Data

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Brainstorm

Refine and Sustain

Acquire and Map Data

Analyze and Report

Write Queries

Acquire and Map Data
• Identify specific sources
• Explore direct vs. flat file access
• Submit written data request, including control totals
• Tie out record counts and control totals
• Trace control totals back to ledger or other source systems

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Data Acquisition
Overcoming Barriers

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- Find the Business Analyst – how do they obtain data for their job?

- Understanding Tables and Relationships

- Data dictionary / local customizations

- Requesting data from Information Technology Staff / Vendors
  - Fixed vs. Variable Length
  - Delimited Files
  - Quoted Text
  - Column Headers

- Balancing / Control Totals

- Where and how best to filter and limit rows and columns?

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QuickStart℠ Methodology
Write Queries

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Brainstorm

Refine and Sustain

Acquire and Map Data

Analyze and Report

Write Queries

Write Queries
• Virtual Fields
• Join
• Summarize
• Stratify
• Extract
• Filtering Criteria
• Trending
• many other command and techniques

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QuickStart℠ Methodology
Analyze and Report

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Analyze and Report
- Consider Trends and Exception Queries
- Graphs and Tables
- Correlation analysis
- Pivot Tables
- Other Techniques
- Charts / color / directionality

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Understanding and Planning
for False Positives

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QuickStart℠ Methodology
Refine and Sustain

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Refine and Sustain
- After-Action Review
- Re-use Queries for Follow-up Tests
- Re-use Queries for Risk Assessment
- Transition Queries to Management

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Refine and Sustain
Continuous Learning culture

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- After Action Review

- Consider timing of key audit tasks
  - What should we do earlier?
  - What could we do later?
  - Who else should we involve?
  - Why?

Start	Stop	Continue

Exercise:
Plan Audit Tests, by Business Process

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Business Process Area	Suggested Tests
P-Card / Travel & Entertainment	
Grant Compliance	
Procurement / Accounts Payable	
HR & Payroll	
Financial Aid	

Checkpoint

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Continuous Controls Monitoring Audits in the Future?
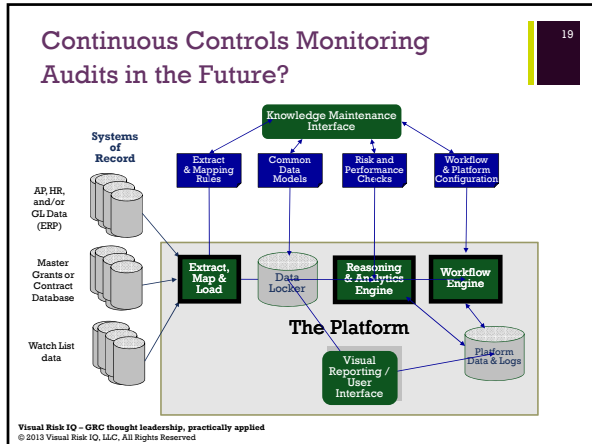
Key Capabilities of CCM

- Non-invasive extraction from systems of record
- Ability to define and easily map into common data models
- Identify and track revisions to master data
- Modern, easily configured data analytics engine
- Identify and store individual exceptions that meet analytics criteria (filters, thresholds, confidence, statistical significance, etc.)
- Interactive review, filtering, assignment and status modification of exceptions
- Integrated visual reporting

Results of CCM Testing - What's possible with in-depth data analytics
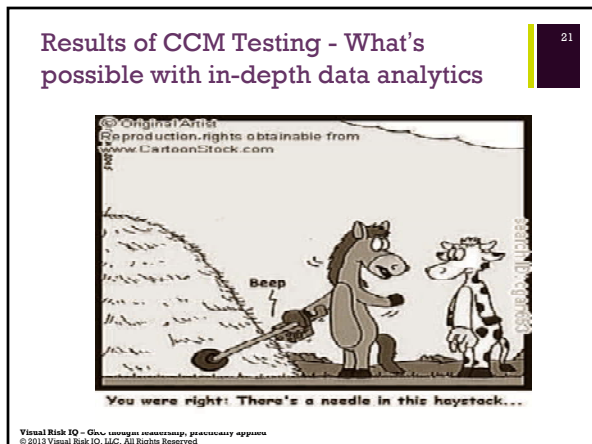
Wrap-up Thoughts

- Consider how QuickStart discussion may help ensure effective communication between business- and data-focused team members

- Use IIA Guidance on Fraud Risk and Data Analysis. They are very good resources and free to all IIA members.

- Begin with defining the questions that you want to answer? Then identify data sources can answer them – both internal and external data sources.

- Establish data analysis routines that can be repeated (i.e. scheduled) on a recurring basis. Ad hoc / one-time tests become the foundation for Continuous Auditing and Continuous Monitoring.

- Challenge your audit team to be the R&D lab for innovation in data analysis. Include as a success measure the tests that are adopted by the business.

For Additional Information

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Or follow us on Twitter at: www.twitter.com/VisualRiskIQ

Use of a Maturity Model to define your company-specific path

- History of Maturity Model
  - Developed on multiple client assignments to help define the path to CA for our clients
  - Shared at an IIA meeting – came together with Arrowpoint Capital - "that sounds like our journey" which began nearly 10 years ago
- Developed IA article together with Arrowpoint
  - Assisted by Wake Forest's Dr. George Aldhizer in preparing article and field-testing ideas and thesis
- Key Learnings
  - Technology is not the first or second or even third priority
  - Business knowledge is critical to sustaining and improving the CA program. Periodic meetings to understand business pulse is essential
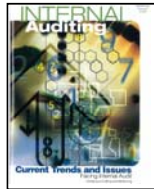
VRIQ's Continuous Auditing Maturity Model, as published in 2009 in WG&L's Internal Auditing

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	Basic practices	Repeatable CAATs	Frequent CAATs	Continuous auditing
People	Staff has some basic data literacy. Knows how to ask IT for digital information	Some IT- and data-specific specialists are accessible, either in-house or as consultants	Audit staff and leaders are IT- and data-literate. Little distinction between IT audit and financial / operational audit people	No need for ad hoc data acquisition - CA and CCM systems are well-integrated into finance, operations, and Enterprise Risk Management (ERM)
Technology	Basic data capture and analysis using MS-Office or ERP Query tools. Heavy reliance on Corporate IT	Some re-usable scripts exist and are used on-demand for relevant audit projects. Prevalent use of CAAT tools like IDEA and/or ACL	ACL and IDEA scripts are stored, scheduled, and run at appropriate intervals in support of audit projects	Continuous auditing and monitoring technologies contribute to all audit steps at project and department level
Governance	Business is reactive to requests from Internal Audit and usually helps in a timely way	Audit department can and does access enterprise data directly at the source	IT consults with IA prior to making system changes that are known to affect IA.	Data driven early warning / risk alerts include both business and controls / audit implications.
Audit methodology	Risk assessments are conducted annually	Updates to risk assessments are conducted more frequently than annually	Risk assessments are scheduled at regular intervals and updated based on internal and external data points.	Risk assessments consider objective and subjective data. Gaps between objective and subjective assessments are highlighted

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Moving up the Maturity Curve is best accomplished in simple, deliberate steps

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