About HCA

• $40B annual net revenue
• $33B total assets
• $7.5B EBITDA
• $2B Net Income
• 233,000 employees
• Common line of business, systems, and security model
Session Agenda

• Factors increasing demand for continuous analysis plus guidance and definitions
• Illustrative continuous auditing and monitoring solutions for human resources and payroll, procurement, and IT
• Identifying and dealing with challenges for successful development and implementation of data analysis audit processes
• Continuous auditing and monitoring maturity model example
Data Analysis Defined

• **IIA (GTAG 16):** “the process of identifying, gathering, validating, analyzing, and interpreting various forms of data within an organization to further the purpose and mission of internal auditing”

• **ACFE:** “the practice of assessing bodies of data to identify potential indicators of fraud”

• **ISACA:** “processes and activities designed to obtain and evaluate data to extract useful information”

• **Wikipedia:** “the process of inspecting, cleaning, transforming, and modeling data with the goal of highlighting useful information, suggesting conclusions, and supporting decision making”
The Beginning: Recognizing The Need

• Higher number and potential impact of risks
• Rising expectations from operational and executive management, board of directors, and other stakeholders
• Increased number of IT applications with larger transaction sets
  – Increasing digital audit universe
• Ever present risk: Fraud
Data Analytics - Why are we here?

• Limited Internal Audit resources
  – Post-SOX pressures on the profession
• Relatively unchanged audit approach
  – An auditor’s best friend: the sample
  – Need practical ways to do more with less
GTAG 3 - Review of IIA Guidance

• Continuous Auditing
  – the combination of technology-enabled ongoing risk and control assessments.

• Continuous Monitoring
  – management process that monitors on an ongoing basis whether internal controls are operating effectively.

• Continuous Assurance
  – performed by internal audit, a combination of continuous auditing and testing of first and second lines of defense continuous monitoring.

• CAATs (Computer Assisted Audit Techniques)
  – automated audit techniques, such as generalized audit software, utility software, test data, application software tracking and mapping, and audit expert systems, that help internal auditors directly test controls built into computerized information systems and data contained in computer files.
GTAG 13 - Fraud Prevention and Detection in an Automated World

- Reiterates IIA Professional Standards
  - 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
GTAG 16 - Data Analysis Technologies

- Emphasizes importance of data analysis
  - Business case for increased assurance
  - Improvements in control and 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 and Benford’s Law
  - Introduces data analysis maturity model
  - Methodology is plan, prepare, test, review
Technology-enabled auditing, which includes data analysis, continuous auditing and monitoring, and the use of computer-assisted audit tools (CAATs), remains a concern.

...survey results have shown technology-related auditing processes and tools to be top priorities with relatively stagnant competency scores.

...trend continues...suggesting that internal audit functions are not achieving sufficient progress in their knowledge and use of technology-enabled auditing.

...time for CAEs and internal audit professionals to reverse this trend, especially in light of the growing importance of IT auditing and the organization’s increasing reliance on data analysis to drive growth and innovation.
A Diamond View or Lump of Coal?

- Continuous Risk Assessment
- Continuous Reporting
- Continuous Assurance
- Continuous Auditing
- Continuous Risk Monitoring
Storming & Forming: Potential Areas

- General ledger activity (journal entries, subsidiary ledger balances, trends, ratios, etc.)
- Human Resources, Payroll and Benefits
- Accounts Payable and Cash Disbursements
- Supply Chain – Purchasing, inventory quantities, pricing, activity
- Information technology
- Currently – approximately 50 routines
General Ledger Analyses

- Changes to goodwill and related amortization accounts
- Review for non-performing assets and/or dormant entities
- Analysis of unusual general ledger activity
- Review business units with significant asset/earnings changes and ratios
- Review of construction-in-progress balances
- Multiple reviews of manual journal entries
Human Resources & Payroll

• Annual validation of name and Social Security by SSA’s Verification Service (SSNVS)
• Analysis of unusual paid-time-off (PTO) taken & available
  – Limited or no PTO hours
  – Terminated employees with remaining PTO balance
  – Negative PTO balances
• Analysis of overtime hours
• Full-time employees averaging part-time hours
Purchase To Pay Cycle

• Group purchasing contracts
  – Contracts with items – but no members to buy
  – Overlapping tiered pricing
• Supply chain purchases
  – Purchase orders created on weekend days
• Accounts Payable Risk Matrix
  – One-time payments
  – Amounts near psychological thresholds
  – Check date prior to invoice date
  – Round-dollar checks
  – Checks cut on weekends or unexpected time of day
  – Sequential invoice numbers
  – Relative size factor
Relative Size Factor Illustrated

<table>
<thead>
<tr>
<th>Largest to 2\textsuperscript{nd}</th>
<th>Largest to Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>$343,291.00</td>
<td>$34,329</td>
</tr>
<tr>
<td>$ 3,432.91</td>
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<td>$ 3,432.91</td>
<td>$ 2,254</td>
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<tr>
<td>$ 3,432.91</td>
<td>$ 1,929</td>
</tr>
<tr>
<td>$ 3,432.91</td>
<td>$ 2,367</td>
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RSF=100

Avg=$2,230

RSF=15

Look for uniquely high RSF or RSF in multiples of 10
IT Security - Real-Time Monitoring

• Local business-unit security coordinator (LSC) access evaluated hourly by Internal Audit
• Automatic e-mails are generated when the LSC increases his/her own access.
• E-mails sent to Internal Audit and SOX security reviewer at the facility
Measureable Results – Security Coordinators

- 700 facility-based security coordinators
- 378,000 measurement points per month
- Average of 10 anomalies per month
- 100% capture and follow-up
- Without Internal Audit involvement, high likelihood of anomalies going undetected
IT Security

• Self-requestable security reports
  – Used to evaluate proper segregation of system controls for certain business applications system functionality
  – Developed by Internal Audit
  – Self-requestable by business units

• Active Directory Deputy Group members
  – Excessive deputy group members?
  – Terminated/transfered members still in group?
GTAG 16 - Data Analysis Technologies

• Recognizes barriers
  – Poorly defined scope
  – Data location and access
  – Data understanding
  – Data preparation
  – Manually maintained data
Challenges and DOH! events

- Significant investment in R&D process
- Resources needed to ‘own’ a scope area for preparation and review
- Volume of false positives
- Vendor data access
- Controlled report delivery
- Timely and meaningful business unit responses
- Root cause identification
- Effects on department processes and metrics
- No authoritative practice guidance
Overcoming Data Acquisition Barriers

• 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
Organizational Technologies
Internal Audit Technologies
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<th>Repeatable CAATs</th>
<th>Frequent CAATs</th>
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<td>Audit staff and leaders are IT- and data-literate. Little distinction between IT audit and financial / operational audit people</td>
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<td>IT consults with IA prior to making system changes that are known to affect IA.</td>
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<td>A dream – but initial concept typically being created in audit universe / heat map diagrams.</td>
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<td>Initial automation of Excel-based dashboard that covers many if not most key business areas. Almost always now a part of the audit committee reports.</td>
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Moving Up the Value Curve

- Accounting and Planning
- Revenue Cycle
- Disbursements

Value Added
- Basic
- High

Complexity of Interaction
- Basic
- High

- External (Standard) Reporting
- General Accounting
- Project Accounting
- Cost Accounting
- Fixed Assets and Reporting
- Order Management
- Customer Billing
- Accounts Receivable
- Credit and Collections
- Account Payable/P2P
- P-Card
- Travel Expense
- Payroll
Coming Soon(er) … or later?

- Visual reporting / trend analysis by anomaly count, type, severity
- Drill through / drill around
- Charts and tables, re-configurable with user defined thresholds
- Linking of disparate, comparative external data sets
  - Purchasing
  - Time capture system
  - Relationships between clinical or other operational systems
- Combining analysis of structured and unstructured data
- Comparison of transaction exceptions with User ID, workstation ID, network / MAC address, and more
Some things to take home

• Find a small win opportunity and get started.
• Identify an audit to specifically leverage data-driven analytics.
  – What questions do you want to answer?
  – Can any analytic be scaled to a continuous audit routine?
• Identify management reports audit used to validate financial or operational performance.
  – Would accessing the data sources directly answer other questions?
• Challenge your teams to be the R&D lab for innovation in continuous monitoring and data analysis.
• Develop your maturity model.
  – Where are you on it?
  – Where do you want to be?