Data analytics and continuous controls monitoring

Institute of Internal Auditors
San Fernando Valley Chapter meeting
April 2009
Agenda

Data analytics
► Overview of data analytics in Internal Audit
► Example data analytics projects

Continuous controls monitoring
► What is continuous controls monitoring?
► Benefits and areas of focus
► Example CCM scenarios
► Sample CCM technologies

“Making compliance repeatable, sustainable, and cost-effective must become the priority for ongoing investment. Continuous monitoring and automated testing is maturing in approach and applicability to be considered for evaluation now rather than later.”

John Haggerty, AMR Research Alert
Data analytics
Data analytics maturity model

Level 1
- No formal data analytics approach, procedures or methodology
- Performed occasionally at best
- Tools are not readily available
- Dependant on skills of limited number of SMR’s

Level 2
- Recognized as a value-add to the audit
- Not yet institutionalized
- Relies on a central group or single person
- Tools are at a disposal, however not applied consistently or correctly

Level 3
- Established data analytics methodology
- Use of analytics is championed by IA
- Creation of data analysis models
- Understanding of the business meaning of data analytic procedures and results
- Increased proficiency in use of tools

Level 4
- Methodology is institutionalized
- Management involved in the on-going data analysis efforts
- Management understands business issues and root cause
- Re-performance of data analytic procedures
- Advanced tools are used effectively

Level 5
- Practices evolved in level 1 through 4 are used to continually improve data analytical processes, procedures and results
- Use of data analysis for continuous controls monitoring
Four guiding principles of data analytics

- **What will happen?**
  - **Predictive data modeling**
    - Statistical, econometric, scenario based

- **Why did it happen?**
  - **Modeling and validation**
    - Revenue sharing models, root cause analysis, legal compliance

- **What happened?**
  - **Descriptive data analysis**
    - Forensic evidence, queries, profiling, MDA, data/text mining, benchmarking, surveys

- **Is your data reliable?**
  - **Information management**
    - Data governance, data conversion, data integrity

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**Analytics value chain**

- **Data**
  - **Information**
    - **Knowledge**
      - **Business insight**
Data analytics addresses Internal Audit’s challenges

► Create sustainable methods for risk assessment and monitoring of the control environment
► Deploy resources effectively to accomplish audit plan objectives
► Audit effectively where systems and/or processes are poorly integrated
► Quantify impact of issues and results in terms of dollars and frequency
► Increase focus on fraud detection procedures
► Better insight into the business that allows Internal Audit to add greater value to the organization
► Respond quickly to changing business needs and compliance requirements with flexible and repeatable procedures
## Using data analytics in Internal Audit

<table>
<thead>
<tr>
<th>Internal Audit activity</th>
<th>Example opportunities to use data analytics</th>
</tr>
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</table>
| Risk assessment                 | ► Identify risk assessment priorities by using information gathered from trend analysis, financial ratios and comparisons  
                                  | ► Assist with determining scope of audit plan activities (by size/relevance)                                 |
| Audit planning                  | ► Provide a preliminary “scan” of relevant audit information to drive project scope, sampling and fieldwork procedures |
| Fieldwork procedures            | ► Support testing of controls in an efficient and comprehensive manner                                       
                                  | ► Identify anomalies, trends and potential fraud indicators                                                  |
                                  | ► Supplement sample testing approaches with full-coverage data analytics                                      |
| Reporting                       | ► Provide quantifiable, fact-based information for reportable issues and exceptions                           |
                                  | ► Supplement reporting with statistical and graphical information gathered during the audit                |
| Monitoring and trending         | ► Automate the ongoing monitoring of the control environment to a sustainable effort through timely exception notification and review |
                                  | ► Analyze trends in the company’s risk profile and identify opportunities for improvement                  |
Example data analytics

Payment stream analytics (AP, T&E, Procurement Cards)
- Duplicate payments
- Data irregularities and unusual transactions
- Purchasing control violations (split PO’s, expenditures above policy limits)

Financial statement computer assisted audit techniques
- Journal entry analytics
- Unusual inter-company and related party transactions
- Accounts receivable aging analytics

Payroll analytics
- Duplicate payroll distributions
- Payments to terminated employees
Example data analytics (cont.)

Master file analytics
► Missing or unusual information
► Duplicate records
► Conflicts of interest

Contract audit analytics
► Royalty payment recalculations (incorrect sales figures, royalty rates)
► Invoicing inaccuracies (overpayments, duplicate transactions)

Unstructured data analytics (i.e. email and text based files)
► Recurring content themes and relationship communication patterns
Continuous Controls Monitoring
What is Continuous Controls Monitoring?

Continuous Controls Monitoring (CCM) is an integrated set of processes and techniques, enabled by technology, which is designed to help an organization:

► Automate the ongoing monitoring of the control environment
► Identify control exceptions continuously (daily, weekly, monthly) based upon pre-defined business rules
► Monitor, track and report the effectiveness of controls
► Identify root causes and improve related processes in a more timely manner
► Reduce the cost of controls
Benefits from using CCM

► Broader coverage
► Increased frequency in testing of controls
► Enhances fraud program activities
► Scalability
► Timely reporting of control violations through exception reporting
► Automated workflow and exception trending
► Greater value and impact of monitoring activities
► Reduced cost of risk management and compliance activities
How to approach a CCM strategy?

Questions to ask:

► What are my pain points?
► What are my drivers?
► What do I want to monitor?
► Who owns the process?
► Who is at stake?
## Areas of Focus – Segregation of Duties

<table>
<thead>
<tr>
<th>Key Stakeholders</th>
<th>Internal Control Environment</th>
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<tbody>
<tr>
<td><img src="image.png" alt="Image" /></td>
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<tr>
<td>Segregation of Duties</td>
<td>Configurable Controls</td>
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<tr>
<td></td>
<td>Master File and Transaction Data</td>
</tr>
<tr>
<td></td>
<td>Information Security / IT General Controls</td>
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</tbody>
</table>

- Detect and/or prevent user access and segregation of duties violations
- Identify and monitor users with access to sensitive areas within the application
- Facilitate user access provisioning and periodic access review process related to IT general controls
Areas of Focus – Configurable Controls

- Detect changes made to critical configurable controls settings
- Verify that system patches and program changes do not impact the integrity of configurable controls
- Enable comparison of configurable controls across business units and against leading practices
Areas of Focus – Master File and Transaction Data

- Monitor master file data and architecture for unauthorized or unusual changes
- Monitor transaction data for control exceptions based on pre-defined business rules
## CCM implementation methodology

### Identify
- Identify key stakeholders
- Co-develop expectations and identify strategic requirements
- Set goals and determine requirements

### Diagnose
- Assess current state maturity of controls
- Assess IT readiness for implementation
- Develop implementation blueprint and business case
- Select CCM technology

### Design
- Develop monitor requirements & specifications
- Design future state CCM processes

### Deliver
- Build monitors in CCM technology
- Test results and refine monitor configurations
- Implement monitors in production environment

### Sustain
- Manage exception review activities
- Monitor control dashboards
- Continuous improvement and reporting to management

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### Technical Infrastructure

### Governance, Risk and Compliance
CCM process

1. Connect data sources

2. Optimize, automate and monitor
   - Business rules
   - Master and transaction data
   - Configurable controls
   - Segregation of duties

3. Receive / validate exceptions

4. Report and refine

5. Refine rules and tailor business processes

Exception repository

Notifications

Routing

Workflow

CFO

IT

BU

IA

Further trending and data analysis

Integrated dashboard

CFO

IA

BU

IT

Research and review

Collaborate

Active SRA

Status
Continuous monitoring - exception management approach

**Blended approach:**
- Shared ownership of exception management process
- Prioritized approach based on nature of exceptions and sensitivity of what is being monitored
- Increased accountability for controls

**Post review activities**
- Monitor controls dashboards
- Trending analysis
- Process improvement

**Exceptions**

**Business Process Management / Shared Services Center**
- Segregation of duties conflicts
- General policy violations
- Routine transaction exceptions
- Control owner notified of exception
- Review and validate exceptions
- Remediate and address root cause
- Document results of exception review and remediation

**Internal Audit / Compliance / Risk Management Functions**
- Sensitive transactions
- Potential fraudulent activity
- Priority risk areas for monitoring activities
- Filter through exceptions
- Validate exceptions with business owners
- Remediate and address root cause
- Document results of exception review and remediation
Example CCM scenarios

► Segregation of Duties
  ► An exception is reported when a user is granted access to post inventory receipts and post inventory adjustments
  ► An exception is reported when the monitor detects unauthorized access to change foreign currency treasury wire transfer information
  ► Identifies segregation of duties conflicts before access is granted

_A CCM strategy to address Segregation of Duties provides Management with a proactive mechanism to identify user access violations as they occur_
Example CCM scenarios

► Configurable Controls
  ► An exception is reported when the tolerance amount for the three-way match control for accounts payable invoices is changed
  ► An exception is reported when the credit authorization approval control is turned off
  ► Configurable control settings are analyzed against leading practice configurable settings for opportunities to strengthen the application control environment (i.e. payment block control)

A CCM strategy for IT Configurable Controls provides Management with a proactive mechanism to identify when key application control settings have been changed
Example CCM scenarios

**Master File Data**

- An exception is reported when the general ledger field structures have been modified in the master table.
- An exception is reported when changes have been made to the general ledger account code options and/or account mapping for automatic system processing functions.
- An exception is reported when a vendor address matches an address in the employee master file.
- An exception is reported when a user with sensitive access uses that access to update the wire payment information for a vendor.

*A CCM strategy for Master File Data provides Management with a proactive mechanism to verify that the integrity of the master file architecture and content is not compromised.*
Example CCM scenarios

Transaction Data

- An exception is reported when a purchase order is created on the same day that goods were received for a transaction
- An exception is reported when an invoice is approved by a person without sufficient authority
- An exception is reported when a user with sensitive access rights inputs and posts an inventory adjustment
- An exception is reported when a manual journal entry has unusual accounts and/or descriptors
- An exception is reported when an employee receives more than one pay distribution in a pay period

A CCM strategy for Transaction Data provides Management with a proactive mechanism to identify potential control exceptions and fraudulent activity
## Sample CCM technologies in the market

<table>
<thead>
<tr>
<th>CCM Technologies</th>
<th>Monitoring Capabilities</th>
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<tbody>
<tr>
<td></td>
<td>Segregation of Duties</td>
</tr>
<tr>
<td>ACL (Continuous Controls Monitoring Solution)</td>
<td>✓</td>
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<tr>
<td>Approva</td>
<td>✓</td>
</tr>
<tr>
<td>Aveksa</td>
<td>✓</td>
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<tr>
<td>Blackline (Financial Statement Close Process)</td>
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<tr>
<td>IDEA</td>
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<tr>
<td>Oracle GRC (formerly Logical Apps)</td>
<td>✓</td>
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<td>Oversight</td>
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<tr>
<td>Reliant Solutions</td>
<td>✓</td>
</tr>
<tr>
<td>SAP GRC (formerly Virsa)</td>
<td>✓</td>
</tr>
</tbody>
</table>

EY does not endorse any of these vendors or products listed above.
EY perspectives on implementing a successful data analytics program

► Focus on “hot button” areas
► Use an integrated team with IT, business process and auditing skill-sets
► Understand the key business processes and desired exception attributes thoroughly
► Obtain a complete understanding of the data structures and derivation of the data fields
► Evaluate data integrity and reliability
► Attain necessary technical skills to use data analytical tools
► Properly validate data analytic results before concluding
EY perspectives on CCM

- Thoughtful evaluation of the CCM technologies and your needs is required to realize optimal results.
- Consider a holistic, risk based strategy when implementing CCM.
- Consider using CCM to enhance compliance testing requirements (SOX, PCI, HIPAA, etc.).
- Sponsorship of the program is critical.
- Thorough analysis of the control exceptions is a critical component to the success of a CCM program.
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