DATA MANAGEMENT

APPLYING DATA ANALYTICS TO A CONTINUOUS AUDITING / CONTINUOUS CONTROLS MONITORING SOLUTION

April 9, 2013
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Agenda

• What is Continuous Controls Monitoring?
• Types of Data Analytics
• Benefits
• Steps for Implementation
• Typical Areas of Focus
• Sample Logic
• The future of CCM
Sunera Snapshot

✓ **Professional consultancy** focused on regulatory compliance, internal audit, information technology and CFO advisory services
✓ Founded by former public accounting partners and professionals
✓ Delivered more than 2000 projects for **800 clients** across a broad spectrum of industries
✓ Employ 170 full-time professionals in **fifteen offices** across Canada and the United States
✓ **PCI** certified security assessor
✓ Registered with NASBA to offer **CPE’s** for our Internal Audit training courses
✓ Certified integration partner for leading continuous controls monitoring solutions, including **ACL**, Approva, Lumigent, and **SAP**.
Common Terms

- Data Analytics
- Continuous Monitoring
- Continuous Auditing
- Continuous Controls Monitoring
Application Control Testing

- Test rules rather than transactions
- Application controls can usually be overridden
- People can still work in collusion
- Seldom compare data from disparate systems, nor look for control breaches

NEED Effective Substantive Testing
What is Continuous Controls Monitoring?

Continuous Controls Monitoring (CCM) is the term used to describe techniques of continuously monitoring and auditing an IT system.

- Typically CCM solutions will be applied to Enterprise Resource Planning systems
- A CCM solution can help to reduce compliance costs (through decreased manual controls and manual testing of those controls), strengthen a company's internal control environment and reduce the risk of unintentional or intentional errors and fraud

The key objective of CCM is to:

- Enable near real-time and regular monitoring of control effectiveness

By monitoring the compliance with key controls, your organization can obtain ongoing assurance on the accuracy and validity of large volumes of data flowing through your systems, enabling the isolation and containment of control failures on a timely basis.
Common CCM / Data Analytics Tools

- A number of tools are available. The right choice will depend on the each companies business requirements, including considerations such as how well the proposed tool will integrate with existing systems and tools
  - ACL
  - SAP or Oracle GRC
  - Approva
  - Oversight
  - Actuate BIRT
  - Actuate e.Reports
  - Cognos 8 BI Report Studio
  - Crystal Reports
  - InformationBuilders WebFOCUS
  - JasperServer/iReport
  - Microsoft SQL Server Reporting Services
  - MicroStrategy Report Services
  - SAS Web Report Studio

Gartner February 2009: Critical Capabilities for Business Intelligence Reporting
Poll 1

Which two are not Data Analytics Tools?

a) ACL
b) Approva
c) Excel
d) ODBC
e) Oracle
Types of Data Analytics?

1. Ad hoc Analysis
   - Time consuming
   - Data typically supplied by IT
   - Up to 50% more budgeted time required
   - Difficult to repeat tests if not documented
   - Exploratory type analysis

2. Repeatable Analysis
   - More skilled required than Ad Hoc testing
   - Pre-defined scripts created to perform same tests over and over again
   - More consistent and can be run more frequently
   - Data may be supplied by IT but imports are automated
   - Good documentation for the scripts / analytics
Types of Data Analytics?

3. Centralized Analysis
   - Development, storing, and running of repeatable analytics is centralized
   - A single, powerful server is setup for the repeatable analytics
   - Data Imports are all automated
   - Standards in place for developing tests and scripting
   - Source data and results are stored on server
   - Better security for data files and result files
   - Great deal of documentation on tests, scripts, data, and sample logic

4. Continuous Auditing
   - Process of performing audit related tasks in a continuous manner
   - Continuous risk and control assessments types of testing
   - Compliance (SOX) control testing
   - Security event monitoring
Types of Data Analytics?

5. Continuous Controls Monitoring (CCM)
   - Very skilled and experienced individuals are able to script and implement
   - All analytics and data imports are fully automated
   - No interaction from end users required
   - Allows for notification to be sent to Business Unit Manager about exceptions identified
   - May involve a web dashboard interface, workflow, remediation tracking, and heat maps
   - Better role based security for reviewing results
   - May provide Management with areas for improvement with Internal Controls
   - A better likelihood of identifying fraudulent activity
   - Acts as a very good deterrent system
Drivers for CCM

According to a recent KPMG LLP survey, the drivers for CA/CCM include the following:

- Fraud detection/prevention – 68%
- ERM – 50%
- SOX 404 compliance – 40%
- Compliance with policies and procedures – 38%
- Regulatory compliance – 29%

Source: Financial Executives Research Foundation, Inc. (FERF)
The Benefits of Continuous Monitoring
Sridhar Ramamoorti, Michael P. Cangemi, William M. Sinnett
Benefits of Data Analytics

- Access data from many disparate sources
- Independent of the systems and people being audited
- 100% transaction coverage with unlimited file sizes
- Read-only data access to ensure the integrity of the data
- Audit Trails are available to identify steps taken
- Scripting/batching capabilities to capture test logic (like macros)
- Very fast to run and produce results
- Easier to comply with the provisions of Section 404 of the Sarbanes-Oxley Act
- Close control loopholes before fraud escalates
- Quantifies the impact of fraud
- Cost-effective
- Acts as a deterrent
- Can be automated for continuous monitoring
- Provides focus based on risk and probability of fraud
- Direct pointers to critical evidence
- Support for regulatory compliance
- Logs for review and evidence
- Scalability – Build on what you need
- External Audit reliance
CCM Automation Benefits

- Validate effectiveness of internal controls
- Identify occurrences of potential fraud
- Identify transactional errors
- Identify segregation of duties violations
- Identify process deficiencies
- Technology driven process
- Tests 100% of transactions as opposed to sampling
- Access data across disparate systems and geographies
- Provide prompt notification of control breakdowns
- Quantified exposure of business risk
- Provides an auditable history of compliance tests and follow-up activities
- Enables better allocation of skilled Audit/Technical resources within the organization
Poll 2

Can data of processes hosted on the cloud (via third party service provider) be used as part of a Data Analytics / Continuous Monitoring solution?

a) Yes, by downloading the data via FTP
b) Yes, by directly accessing the data on the cloud
c) No, proprietary formats mean data can’t be used
d) No, security prevents data from being accessed
What are the Challenges?

IMPLEMENTING CHANGE!!!!

- Change in culture for the organization
- Defining what CCM can accomplish
- Large volumes of data in multiple applications
- Understanding data and processes
- Monitoring of manual controls
- Current reliance on reporting
- Cost to implement
- Ability to integrate with multiple compliance frameworks and into the existing IT environments

HOW DO YOU MAXIMIZE YOUR INVESTMENT IN CCM?????
Where to Apply Data Analytics

What controls are eligible for automated testing?

- Electronic data is available and accessible
- Access to data through an automated process is possible
- Rules can be documented or captured within test logic
- Internal controls and Compliance controls

What are the ideal conditions for automated testing?

- Large number of controls are in place
- Large volumes of data
- Multiple systems and data sources
- Data at multiple locations
- Capture fraudulent activities prior to a transaction reaching the end of a process
Poll 3

What controls are not eligible for testing using Data Analytics?

a) Controls where electronic data is available
b) Internal Controls or Compliance Controls
c) Controls that are purely manual in nature
d) Controls with automated processes for data access
Data Analytics Project Team

• Project Team Skills

✓ Project Manager
  • Organize and manage all resources to complete the implementation project within the defined scope, time, and cost

✓ Business
  • Key owners of each business process to be monitored

✓ Internal Audit
  • Process and control experts to identify areas of risk and test design

✓ IT Department
  • Key owners of the data and primary systems related to each of the processes

✓ Technical
  • Specialized experts to build, configure, and implement the monitoring tools
Steps for Implementation – Sunera Approach

Step 1 - Assess controls

• Identify opportunities for improving process through Data Analytics
• Identify analytics opportunities within specific business processes
• Identify and verify all compensating controls

Step 2 - Scope and design system requirements

• Create “Requirements Documentation”
  – Data Requirements from all available sources
  – Confirm test logic
  – Confirm required parameters
  – Confirm reporting fields
• Obtain agreement and sign off on Requirements document

Step 3 - Data warehouse implementation
Steps for Implementation (continued)

Step 4 - Data access requirements definition
- Obtain sample data from all required sources
  - Directly or Data dump
  - Verify data based on Requirements document
  - All fields present
  - No corruption of data
- Perform Data Preparation

Step 5 - Analytics script development
- Create scripts for tests
- Create excel result sets

Step 6 - Results verification and review
- Have end user and / or Business Unit Manager verify results

Step 7 - Adjusting logic, parameters, and thresholds
- Tweak any tests to remove false positives
Steps for Implementation (continued)

Rollout

- Create scheduling for all tests
  - Daily, weekly, monthly, quarterly
- Move all pieces into production environment
- Verify data connections / feeds
- Create documentation for handoff
- Provide training to CCM stakeholders
A Mature Data Analytics Overview

- Self contained on dedicated server
- Fully automated and scheduled
- Alerts to Business Unit Managers or stakeholders of results
- Clear and concise documentation
  - For all scripted analytics
  - For setup and configuration
- Training provided to any and all individuals involved; including new hires
- Ongoing review of existing analytics and possible new analytics based on new business processes
- Maintain a change log for any addition or removal of scripts or changes to configuration
Data Analytics – Typical Areas of Focus

• Revenue / Accounts Receivable
  – Analysis of collections / aging
  – Test billings for changes / patterns
  – Working interests

• Capital Expenditures
  – Analyze history of expenditure
  – Test expenditure classifications based on descriptions
  – Test who can post entries / approvals
  – Test expenditure patterns looking for application of expenditures to other Projects to utilize budget space
  – Capital expenditure incurred prior to approval
  – Vendor / Contract audits to compare invoice to contract
Data Analytics – Typical Areas of Focus (cont)

• Accounts Payable
  – Phantom vendors
  – Vendor / Employee collusion
  – Questionable invoices
    • Invoices without a valid P.O.
    • Sequential invoices
  – Over-billing
    • Quantity shipped less than quantity ordered
    • Pricing outside norm for product category
    • Item shipped of lower value than item ordered
    • Duplicate invoices
  – Multiple invoices for same item description
    • Invoices for same amount on the same date
    • Multiple invoices for same P.O. and date
Data Analytics – Typical Areas of Focus (cont)

• Purchasing
  – Purchase splitting
  – Purchase cards
    • Inappropriate, unauthorized purchases
    • Transactions that occur on weekends, holidays, or vacations
  – Questionable purchases
    • P.O./invoices with amount paid > amount received
    • Purchases of consumer items
  – Split purchases
    • Similar transactions for same vendor within specific timeframe
  – Inflated prices
    • Compare prices to standard price lists or to historical prices
  – Phantom vendors
    • Vendor/employee comparison
    • Vendor has mail drop as sole address
Data Analytics – Typical Areas of Focus (cont)

• Travel & Entertainment Expenses
  – Duplicate claims, inappropriate activity
  – Travel related charges not on travel expenditure reports

• Payroll
  – Phantom employees
  – Unauthorized overtime

• Time and Expense
  – Duplicate claims
  – Tracking “no receipt” claims
    • Isolate expenses without receipts and identify underlying trends through profiling techniques
  – Threshold reviews
  – Inappropriate activity
  – Compare expenses to travel records to ensure expenses are for valid trips
  – Trends by employee compared to peers
Data Analytics Sample Logic

Duplicates

• Exact Duplicate – All fields identical within investigation period
• Almost Duplicate Variance, Same-Different Duplicates
  – Purchase Order: Same Vendor and Similar Amount
  – Payments: Different Vendor Same Bank Account
  – Payments: Same Vendor Different Invoice Number Similar Amount
  – Payments: Same Vendor Same Invoice, Same Amount, Different Date
  – Payments: Same Vendor Name, Same Amount, Same Date, Different Vendor ID
Poll 4

When conducting Duplicates Payments testing, what source data should be used?

a) Payments data
b) Invoice data
c) Requisitions data
d) Check data
e) Banking data
Data Analytics Sample Logic

- **Authorization Limits**
  - Single and multiple accumulated values exceeding limits
  - Transaction amounts that exceed or are just below the authorization limit
    - Requisitions, Purchase Orders, Invoices, Payments
  - Accumulated transaction amounts that exceed the authorization limit
    - Split Requisitions, Split Purchase Orders, Split Invoices, Split Payments

- **Aging**
  - Single Record Age
    - Days difference between Create Date and Approval Date
    - Stale Requisitions, Stale Purchase Orders, Stale Invoices
  - Multiple Files Aging
    - Retroactive PO vs. Invoice (Invoice Create Date prior to PO Create Date)
Data Analytics Sample Logic

• Data Quality
  • Identifying fields where critical data elements deviate from expected values and formats.
    – Invalid ID formats, missing key values, invalid characters, invalid values
    – Requisitions, Purchase Orders, Invoices, Received Goods, Payments

• Matching (Join) - Amounts over variance thresholds
  • PO Line Item vs. Invoice Line Item
  • PO Line Item Quantity vs. Goods Received Quantity
  • Accumulated Invoice Line Items vs. Payment
  • Accumulated Invoices vs. Bulk Payment

• Unmatched (Join) – Orphaned records or missing records
  • Unauthorized Users: Requisitions, Purchaser
Data Analytics Sample Logic

• Segregation of Duties
  – SOD Security Table Level
    • Comparing roles within ERP security tables to a conflict matrix
  – SOD at Transaction Level
    • Single Record Create/Modify vs. Approve
      – Requisitions, Purchase Orders, Invoices, Payments
    • Multiple files
      – Create/Modify PO vs. Create/Modify/Approve Vendor Master Update
      – Create/Modify PO vs. Receiver ID for Goods Received
      – Create/Modify PO vs. Create/Modify Invoice
Data Analytics Sample Logic

• Date Pattern Matching
  • Suspect transaction dates occurred on a weekend or holiday
    – Expense Report transactions on weekends or holiday
  • Period close dates
    – Journal Entries where the current entry date is within a specified number of days prior/after the period close

• Variance Tests
  • Count and amount variance as compared to a yearly average.
    – Invoice vendor product price variance
    – Excessive vendor invoice counts
Data Analytics Sample Logic

• **String Pattern Matching**

  • **Name Match (% word match)**
    – Word exclusion lists to remove common words like: The, company, and, etc.
    – Invoice: Employee Vendor Name Match – (Phantom Vendor)
    – Invoice: Prohibited Vendors
  
  • **Address Match (Numeric or Alpha Numeric match)**
    – Match on zip/postal code plus numeric digits from address field.
    – Match on alpha-numeric values from the Address field (no spaces or special characters)
    – Invoice: Employee Vendor Address Match – (Phantom Vendor)
  
  • **Soundslike Match (phonetic match)**
    – SOUNDEX algorithm
    – SOUNDSLIKE algorithm
    – Payroll: Similar Employee Names
    – T&E: Different expense cards assigned to employees with similar names
The Benefits of CM – FERF Research

To better understand how companies have implemented CM today, the research team interviewed executives at eleven major companies. Key findings from this research are highlighted below:

- **CM Deployment**: Leading companies recognize the importance of Monitoring, and are effectively deploying CM across functions and departments.

- **Resourcing CM Initiatives**: CM programs require a company focus and a commitment of resources. Some companies mentioned the need for ROI estimates, but others look beyond monetary justifications and focus on operational effectiveness and risk reduction.

- **Need for CM Champion**: CM programs need a Champion, preferably at a senior executive level, because resources will be required.
  
  - **Internal Audit as Evangelists**: Although CM is a business operations issue, IAs, due to their familiarity with Continuous Auditing, often become the champions of CM programs.

- **CM of Payment Streams**: CM is often initiated in payment-related areas, such as Accounts Payable and Claim Payments, in which, due to cash recoveries, the ROI can be estimated.

- **Expanding Initiatives**: There was a keen desire to expand the application beyond the initial program, as well as move up the maturity curve.
The Future of CCM: Promise and Potential

- CCM enables management to assess business performance, business risks, and associated control processes in a timely, economical, and effective manner.
  - CM initiatives can be designed and targeted so as to mitigate risk, enhance performance, reduce cost, achieve regulatory compliance, improve business process efficiencies, strengthen internal controls, and thus drive value.
- When well-implemented, CCM uses sophisticated tools and has powerful capabilities in review and analysis, including performing predictive analytics. Recent advances in technology have further accentuated the importance of CM, and it shows every sign of becoming a key source of competitive advantage in the future.
- Predict that the sophistication of CM tools will likely increase in the coming years, especially in environments such as cloud computing, globalization, and technology savvy professionals (e.g., the coalescing of the CFO and CIO roles as seen in the CFO/CIO Gartner Study 2011). Speed and agility will likely become a major factor determining the winners in a global business context.

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Data Analytics Rollout Options

• **Insorce**
  – Internal resources plan and deploy all CCM initiatives

• **Outsource**
  – Outside provider performs all the activities required for CCM rollout
  – Provides documentation and training to client staff for maintenance of the program

• **Co-source**
  – Outside provider offers knowledge and expertise and works with client staff
  – Shares the work of developing and creating tests
  – Provides guidance
  – Performs reviews of client work conducted and provide feedback / insight
  – Conducts coaching sessions
  – Provides ongoing support and advice
Data Management Consulting Services

• Consultants can work with your organization on a time & materials basis to assist with any of the following activities:
  – Forensic investigations
  – Cost recovery
  – Compliance audits
  – Establishment of a continuous monitoring program

• Specific procedures would include the following:
  – Identification and development of Data Analytics audit programs/procedures
  – Obtaining access to data tables (i.e. establishment of ODBC connections or data requests for IT)
  – Script development (basic to complex)
  – Interpretation of data analysis/results
  – Confirmation of exception results (i.e. identify any false positives and remove)
  – Management reporting
  – Establishment of continuous monitoring procedures/scripts
Contact Information

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Q & A

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