Using CAATs for Risk Reduction and Project Efficiencies

Jonathan Shipman, Senior Manager, Ernst & Young
Anh Doan, Senior Manager, Ernst & Young

Core Competencies – C23

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1. BUSINESS CASE FOR ANALYTICS

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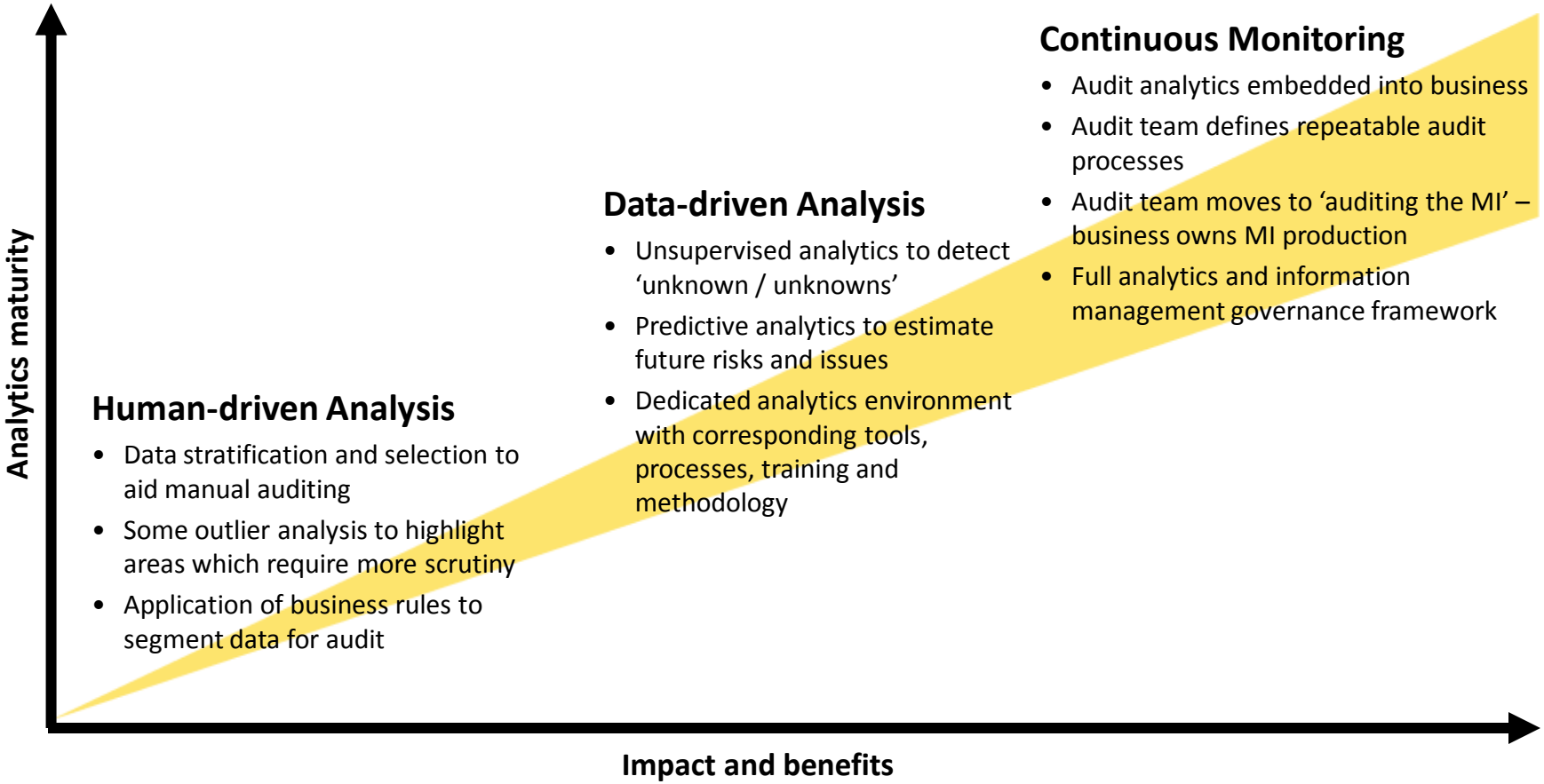
Quick overview of analytics (setting the stage)

What is analytics?

Unsurprisingly, as with a number of widely used business terms, people's definition of analytics in the context of internal audit can differ greatly. We see three main areas of analytics which are used to varying degrees by organizations:

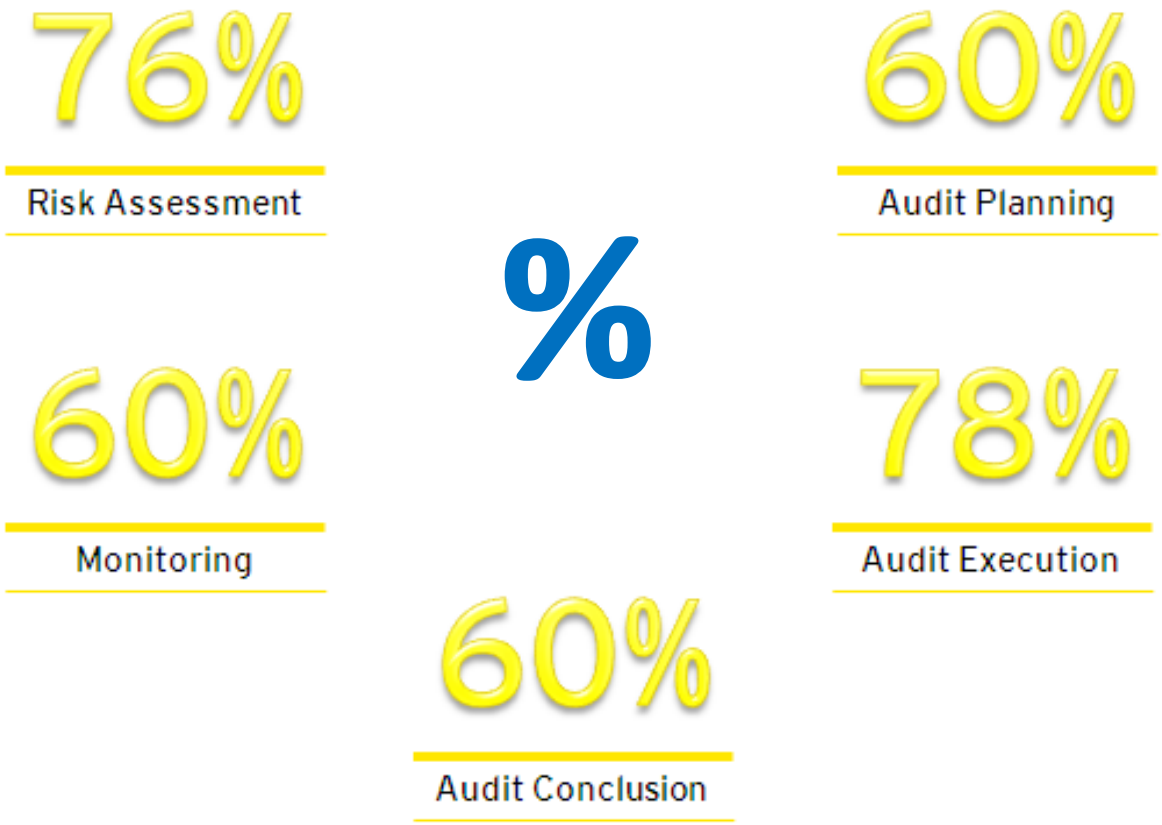
- **Human-driven analysis:** Controls and expert rules coded to run across a set of data or data 'slice and diced' across a number of dimensions
- **Data-driven analysis:** unsupervised analytics is used to detect unknown risks, predictive analytics used to forecast future risk trends
- **Continuous monitoring:** combination of human and data driven analysis is automated and control workflows created from the output

Analytics maturity



Maximum impact requires investment in people, knowledge, technology and methodology.

Question to audience: At which phases of the internal audit lifecycle do you use data analytics?



Source: IA Forbes survey 2012 – EMEA results

The availability of Big Data has created more opportunities and a greater need to use analytics throughout the internal audit lifecycle

- A 2011 Global survey of 363 c-suite executives published by Oxford Economics noted that CEOs sense that they will only keep up by using real time business intelligence and data analysis to support both faster decision making and to cope with the unpredictable market risks and opportunities.
- The digital economy is being transformed through cloud computing, mobility, social media and business intelligence.
- The financial crisis and evolving regulatory environment has placed extraordinary pressure on organisations to both reduce costs and improve risk controls.
- In parallel data availability has significantly improved and organisations are starting to understand the value of analysis, driven by themes such as Big Data.

This has created more opportunities and a greater need to use analytics throughout the internal audit lifecycle:

- **Risk assessment:** comparing risk levels across lines of business
- **Audit planning:** using analytical sampling techniques to select the correct population for testing
- **Audit execution:** detecting 'unknown unknowns' and analysing emerging risks
- **Audit conclusion:** visualising key risks and control outputs
- **Monitoring:** championing continuous monitoring solutions into the business

Unfortunately internal audit functions are rarely embracing the use of analytics due to common issues

- **Data quality:** although data quality is important to effective analytics, we see audit teams wasting effort trying to fix the data or producing ineffective analytics with ineffective data
- **Getting the right data at the right time:** data sourcing requires a lead time that needs to be embedded into the audit plan. Data requirements need to be defined in advance of each audit
- **A constantly changing business:** as the financial crisis and the wider regulatory landscape forces organisations to adapt and change, analytical focus needs regular adjustment. In addition, a changing landscape can create emerging risks that require complex analytics in order to assess.
- **Prioritisation of skills in analytics:** not only are skills in analytical tools (and particularly advanced analytics such as predictive modelling) scarce, internal audit analytics can be highly complex. For example, whilst a typical risk or marketing analytics exercise will have somewhat stationary targets and data, a typical internal audit analytics engagement will involve a wide variety of disparate data sources and a complex set of goals.
- **Using the right tools:** Although existing audit-focused tools are capable of simple analytics, they are typically capable of more advanced analytics such as predictive modelling, unsupervised analytics and forecasting.

Addressing the use of analytics can be accomplished by focusing on 4 key themes

- **Embedding analytics into the audit plan:** leading organisations are embedding analytics throughout the audit lifecycle and ensuring data issues are resolved in advance of upcoming audits
- **Start small, think big:** they aim for success on an initial prioritised selection of audits but plan ahead to ensure scalability
- **Use the right tools:** use analytical tools that have strong predictive modelling capabilities to allow the assessment and trending of emerging risks
- **Measure it:** ensure benefits are tracked and success is shared

Value proposition for using analytics

Analytics when used in conjunction with traditional audit techniques (walkthroughs, interviews, control tests, etc.) can yield significant value

Key objectives	Potential benefits
Deeper business understanding & focus on risk	• Analytics allows an auditor to link data to business processes driving a deeper understanding of the business and risk • Broader sampling increases comfort with coverage and the likelihood of identifying control gaps
Lower costs	• Analytical audit techniques are more cost effective than traditional techniques • A recent study from Rutgers University found that "Analytic procedures cost $0.01 compared to $4 for a standard audit of the same evidence"
End to end testing and ability to rapidly execute "deep-dive" audits	• Analytics can track data across corporate functions and business units allowing a view and ability to capture issues missed by focused testing and business/compliance groups • Ability to provide audit evidence independent from reliance upon management
More population and control coverage; greater assurance	• Analytics for 100% testing of transactions vs. sampling • Additionally analytics allows an auditor to analyze more deeply gaps in controls , which allows for a broader design and operating effectiveness assessment
More value to stakeholders; Better "quality of evidence"	• Stakeholders can see control deficiencies more comprehensively and can't argue samples weren't representative • The audit naturally leaves behind intelligence and tangible material for business units to accelerate the implementation of new controls
Meet regulatory expectations	• Address regulators increasing expectations regarding the use of CAATs

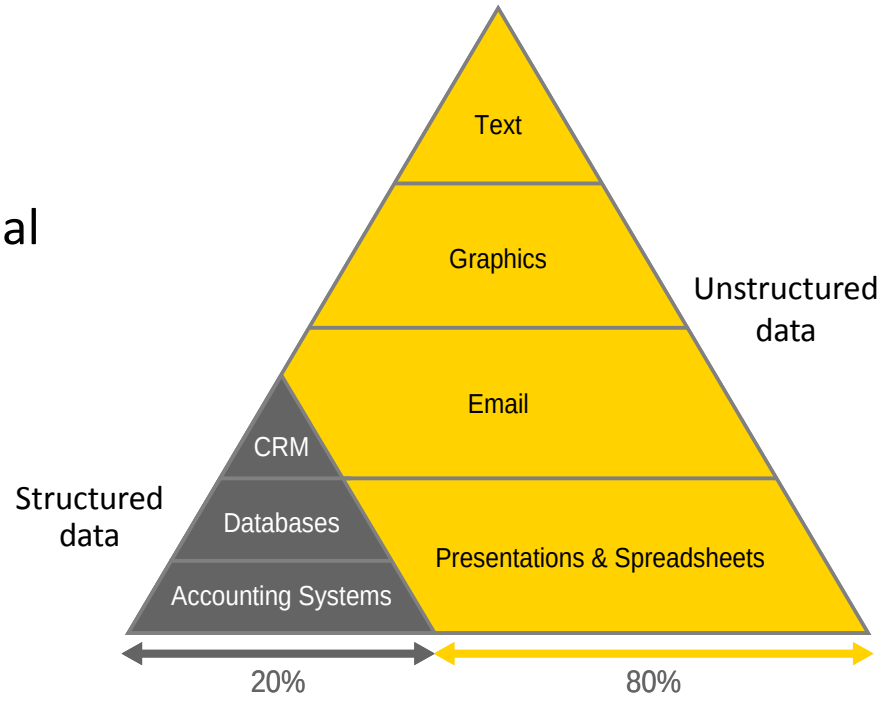
Benefits of increased use of data analysis techniques on audits

Value for the company	• Ability to comment on the quality of general and sub ledgers • Increased focus on high risk transactions • Generate insights around the business and operations • May point out weaknesses in controls
Improved quality of audit evidence	• Increased understanding of the client • Improved risk identification • Transactions selected based on risk, rather than a random sample • Procedures based on 100% of transactions
Opportunity for efficiency	• Automation of routine audit program steps • Assistance with the generation of lead schedules • Assistance with performing roll forwards

Example application: Fraud testing based on unstructured data

When considering enterprise risk, all sources of data should be addressed

- 66% of fraud is detected by "accidents" or "tip" – 2008 ACFE Report to the Nation on Occupational Fraud and Abuse
- Gartner study shows that 80% of enterprise data is unstructured in nature
- Most internal audit procedures focus on the 20% structured data



Few organizations have the methodologies or technologies to efficiently address unstructured data

Source: Gartner Research

2. WHERE TO USE ANALYTICS

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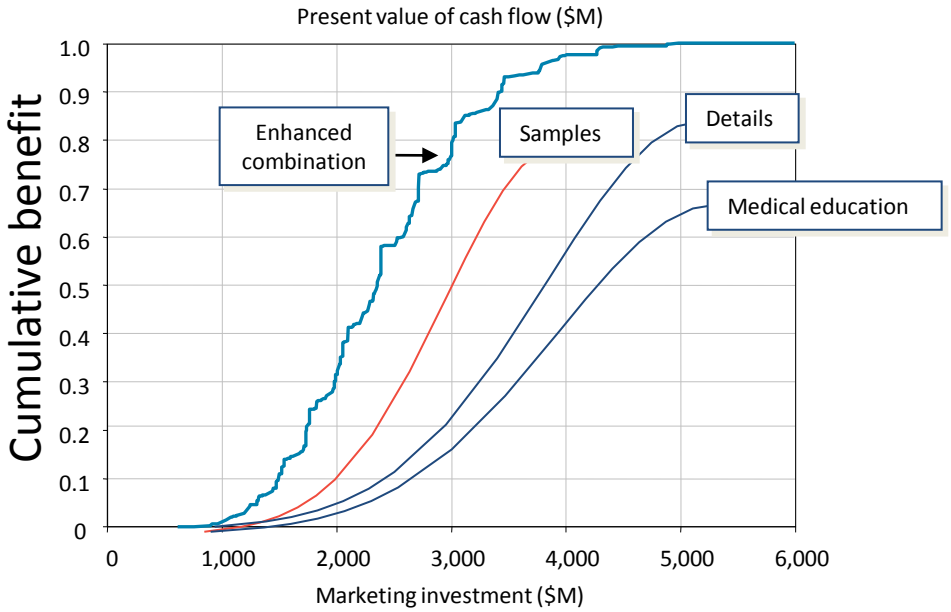
The use of analytics to support IA's mandate

	Internal audit mandate	Blocking & tackling	Business insight	Strategic advisor
Summary	Description	Internal audit has a mandate focused on providing assurance over baseline internal control structure	Internal audit has a mandate focused on providing assurance and operational insight to business	Internal audit has a mandate focused on providing assurance, operational insight and aligning the strategic priorities of the business
IA focus	Risk management focus	Basic compliance, operational and financial risk; Sox testing	Broader operational risk management framework	Risk-adjusted performance strategy
IA focus	Focus of recommendations	Controls weaknesses and improvements	Process recommendations quantified results/benefits	Strategy/decision support ; change assessment; Risk dashboard
IA focus	Internal audit career path	Career internal auditors	Business role rotation	Develop future business leaders
Data analytics	Use of data analytics	DA should be integrated in IA testing to obtain efficiencies and greater risk coverage • Substantive testing • Control testing • SOD testing • Application assessment	DA should be integrated in every phase of IA service delivery especially planning: • Fraud detection • Process improvement • Data quality	DA should be integrated in every phase of IA service delivery with a focus on continuous monitoring and performance analytics; business planning and decision support • Input to risk dashboard • Assess change initiatives • Analytics used by business
Infrastructure	Data analysis infrastructure	ACL, Excel, MS Access/SQL; Possibly data analytics resource; limited training ; limited measurement of benefits/use of data analytics	Leverage Enterprise Technology and data infrastructure; Dedicated analytics resource plus core data analytics training curriculum; Use of data analytics measured, rewarded and benefits reported	

The use of analytics to drive a more robust, data driven risk assessment process

- Modeling and analysis of current, historical and projected data in order to make predictions about future events leads to enhanced decision-making and enhanced performance.

- Example of analytics risk assessment include:
  - Regression techniques
  - Time series models
  - Scoring
  - Scenario-based models
  - Statistical and econometric models
  - Probabilistic estimation



A conceptual overview of how analytics are used to address business objectives

Business objectives:

Grow 10/10/10	Improve cash flow	Operational effectiveness
Reporting/compliance	Cost reduction	* Anti-fraud

Finance	Human Resources	Tax/Treasury	Contract & Delivery	Supply Chain	Fraud Analytics	Assets, Leases	Others
G/L analytics	Payroll analysis	Depreciation	Contract type, risk analysis	Vendor risk profiling	* FCPA analytics	Asset/Lease cost analysis	Data quality analysis
Ratio analysis	HR master data analysis	Policy compliance	Contract term analytics	Alliance, cost benefit analysis	* Anti-money laundering	Use/Buy decision review	True cost of data issues
Profitability analysis	Payroll overpayments	Reconciliation Analysis	Delivery/SLA compliance	Spend analytics	Variance analytics	Total cost of assets review	SOD impact analytics
A/R, credit analysis	Talent mgmt	Intercompany Analysis	Invoicing trend analysis	Client initiated procurement	* Fraud investigations	Depreciation impact analysis	Security data analytics
Time & expense analysis	Compensation analysis	Tax policy compliance	Collection analysis	Discount terms, use analytics	* E-discovery analytics	Capitalization reviews	Close metrics performance
Cash Flow analysis	Overtime analysis	Tax rate analytics	Contract cash flow analysis	Category Management	* Text mining	Lease payment analytics	Revenue recognition
A/P analysis	Employee effectiveness	Entity structure analysis	Contract cost analytics	Acquisition strategy review	* Other fraud analytics	Asset/Lease risk analytics	Project effort estimation

Assess risks, detect issues, predict anomalies, assess compliance…

3. HOW TO IMPLEMENT

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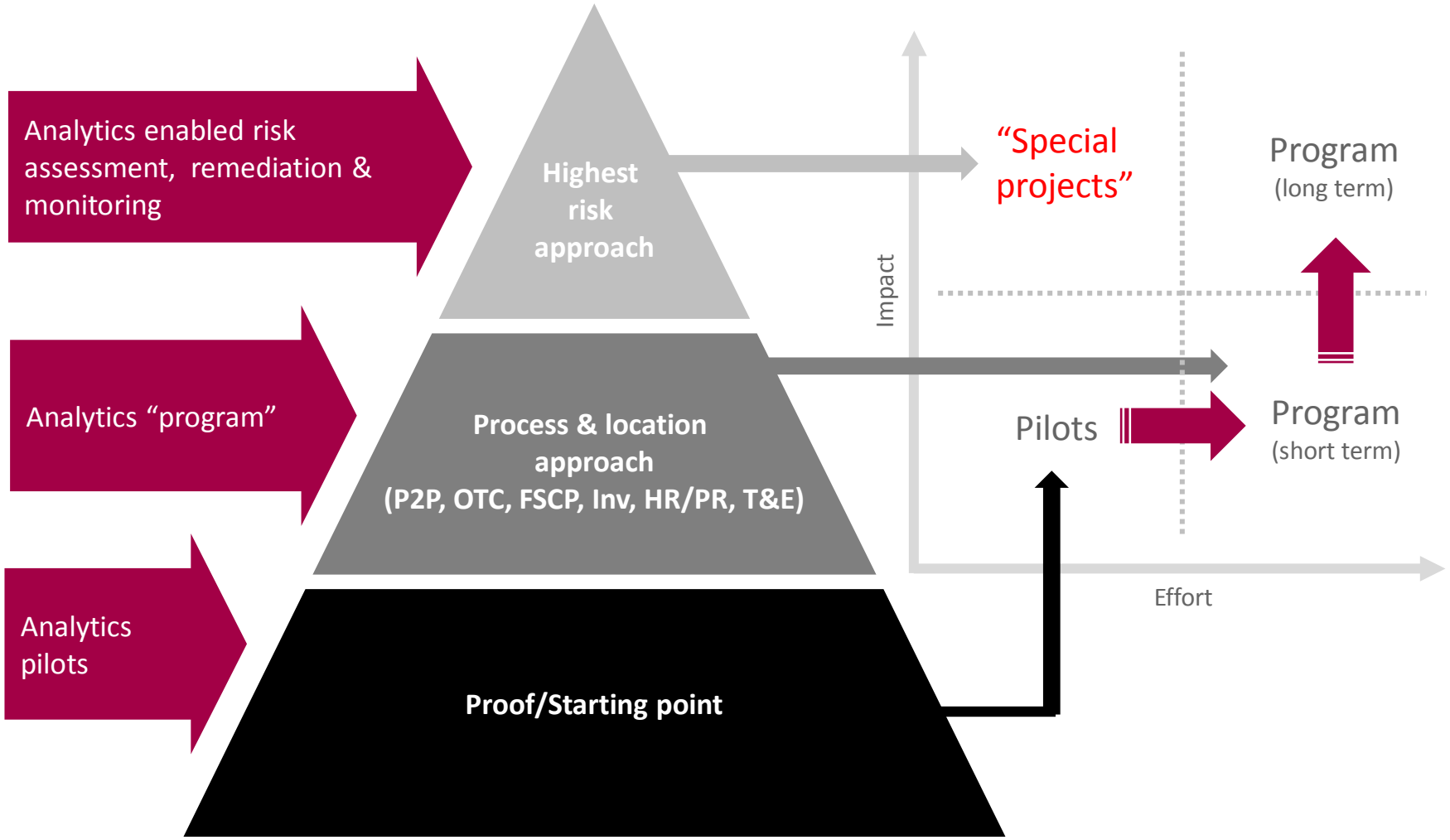
Integrate analytics in IA drives an audit experience that is efficient, dynamic & focused on business improvement

Annual audit cycle	*Key inputs*	*Key analysis*	*Key outputs*
Co-develop expectations	Strategic objectives Business objectives Stakeholder needs Critical success factors Risks	Changes to the business Environmental changes Emerging risks Issues trend (historical) Indicators (historical)	Define/Refine IA strategy Define reporting requirements Identify data requirements to support predictive analytics
Conduct risk assessment	Key business parameters Transactions (previous year) Audit results and metrics CCM, other systemic controls Other parameters …	Predictive analysis Risk scoring Trend analysis Value generation System effectiveness	IA targets by org, area, risk Input for facilitated sessions Effectiveness analysis Input to resource planning Risk assessment report
Develop audit plan	IA targets by org, area, risk Input for facilitated sessions Effectiveness analysis Input to resource planning Risk assessment report	Proposed procedure analysis Risk coverage analysis Project budget, planning Resource optimization Audit cost optimization	Project budget baseline Risk coverage report Resource optimization report Cost optimization report
Audit execution	Audit procedures, results Transactions (periodic) Key business parameters CCM, Analytics, other systemic controls and metrics	Predictive analysis Data analytics Fraud analysis Risk scoring Budget to actual analysis	Potential anomalies, fraud Potential control issues Adjust risk assessments Identify additional audits Audit execution, reporting
Communicate results	Audit execution, results Planning, Actual metrics (Resource, cost, etc.) Prevented anomalies, frauds, issues, $, etc.	Issues analysis Business benefit analysis Risk, potential issue analysis Budget to actual analysis etc.	Audit dashboards, status reports Issues, anomalies Business benefit dashboards IA value scorecard
Annual audit cycle			

Move to an era of "agile" internal audit that operates in tandem with the business

	Stakeholders need:	Analytics in IA will drive:
Executive leadership (Board of Directors, Audit Committee, C-Suite)	• Ability to make timely and informed decisions • Prevent issues and frauds • Proactively adjust business plans to address risks	• Key strategic inputs • Global business visibility • Predictive identification of potential risks
Business leadership & management	• Ability to identify and address risks before they transpire. • Optimal level of cost effective controls • Effective performance management, measurement • Enhanced resource planning and allocation	• Visibility and transparency to key operational risks • Identification of potential 'red flags' in the business • Insights into impact of Key Risk Indicators (KRIs) on Key Performance Indicators (KPIs) • Assurance on the control appropriateness and effectiveness in management of risks
Internal Audit (Global Internal Audit and other compliance functions)	• Transformation of IA from 'policing' to 'partnering' • Enhanced end to end IA function through impactful business data insights. • Ability to rapidly react to changing business circumstances and risks.	• Increased focus and efficiency in the IA function. • Continuous risk assessment enabled by predictive analytics • Real time, need based information and reporting.

Embed a full analytics program including special project with internal audit to maximize the benefit



An analytics program has multiple "analytics touchpoints" across the IA lifecycle

Key activity examples

Risk assessment	Audit planning	Audit execution	Audit reporting	BU action plan	Monitoring
• Risk identification • Journal entries • Material transactions • Significant account activity analysis • Customer churn • Product churn • Segregation of Duties • Embed analytics in existing client risk assessment process	• Specific risk identification • Scoping • Communications • Research current available data & information • Coordinate lead time to execute • Customize data requests	• Process analytics • P2P, OTC, FSCP, inventory, fixed assets, HR/PR, T&E • Contract analytics • Analytic testing of other significant processes	• Dashboards • Scorecards • Benchmarks • Excel output	• Interpretation of results • "Special projects"	• KPI monitoring • KRI monitoring • CCM

Outputs

Risk assessment	Audit planning	Audit execution	Audit reporting	BU action plan	Monitoring
• Risk ranking • Visibility into highest risks • Identification of unknown risks	• Identification of audits to incorporate analytics	• Analytics execution	• Business insight • Identification of process defects	• Action plan recommendations	• Repeatable analytics • Thresholds • Risk appetite

It is critical to prioritize areas where analytics may be used

- Control testing within processes
- Compliance testing
- Forensics/Fraud/FCPA
- Fraud management
- Process audits:
  - Base to billing comparison
  - Billing control verification
  - Billing systems testing
  - Cash management
  - Credit risk assessment
  - Depreciation
  - Data warehousing
  - Debt collection
  - Capital expenditures
  - Contract compliance
  - Leases
- Process audits (continued):
  - Expense management
  - Purchase card
  - Travel
  - Financial accounting analysis
  - Government levies recalculations
  - Insurance claims analysis
  - Interest recalculation
  - Inventory analysis
  - Loan & credit analysis
  - Premiums provisioning
  - Price optimization
  - Re-insurance
  - Remediation assurance
  - Revenue assurance
  - Supply chain
  - Transaction verification

The uses are endless

Progress beyond ad hoc data analysis

- Audit methodology and audit programs have to change – not just about having technical staff
- Takes time and requires executive (and internal audit) support
  - Executive sponsorship (Board/Audit Committee, Executives and Internal Audit)
  - Employ change management techniques
  - Measure and report data analytics use and benefits
- Start small with quick wins – build iteratively
- Reward use of data analytics
- Identify champions and work with supporters analytics supporters (identify business pains)
- IA often lacks appropriate funding - leverage enterprise technology and data infrastructure – be an enterprise information stakeholder
- Develop analytics and routines valuable to the business/IT – use their reports
- Develop skill sets usable outside of Internal Audit
- Data environment often poorly documented
- Make sure internal auditors understand the business they are analyzing

Develop execution strategy

Create a plan to fill current state gaps and achieve your target state

Integrating analytics into an audit function can add value immediately. However, a mature operating model will likely take 1 to 3 years attain given the complexity of conducting analytics (people, technology) at a high level.

Rating	Description
Basic	Limited activities exist for this performance factor
Evolving	Some parts of this performance factor exist, application on different levels is inconsistent
Established	Performance factor is pragmatically defined, consistently applied on some of the levels involved
Advanced	Performance factor is defined in more detail, consistently applied on many levels involved
Leading	Performance factor is defined in more detail and consistently applied on all levels involved

Year 1

Governance
- Establish an analytics governance process
- Educate the organization on the importance of analytics

People
- Invest in training for selected resources
- Analytics champions identified and deployed
- Fill resource gaps with FTEs or consultants

Infrastructure & Operations
- Select tools and technology for data acquisition and forensic tests
- Develop, implement and test methodology and operations against actual pilot projects across each business group
- Demonstrate value to business teams through "quick hit" wins
- Implement 2013 analytics audit coverage plan

Year 2

Governance
- Analytics governance model clearly defined, understood and implemented

People
- Fully operational training program developed and operating
- Substantial progress on build-out of staffing model

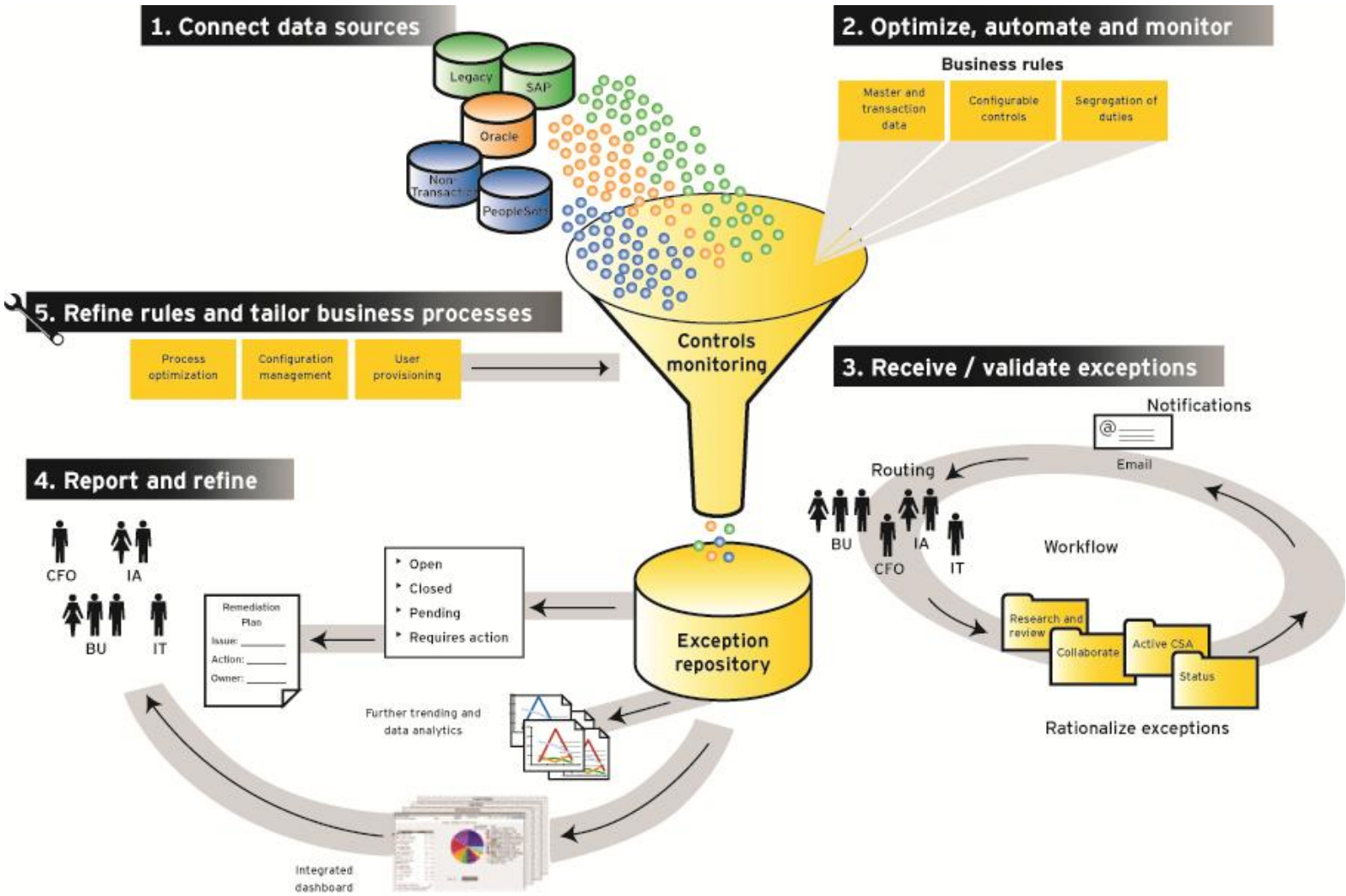
Infrastructure & Operations
- Substantial progress on build out of standardized tools for the use of analytics across audit teams
- IT support infrastructure operational
- Analytics considerations embedded into planning process
- Analytics impact on audit methodology understood and operational
- Analytics audit coverage plan incorporated within the annual internal audit plan process

Year 3

People
- Future state staffing model fully implemented, supplemented as required
- Continuous improvement on training program deployed

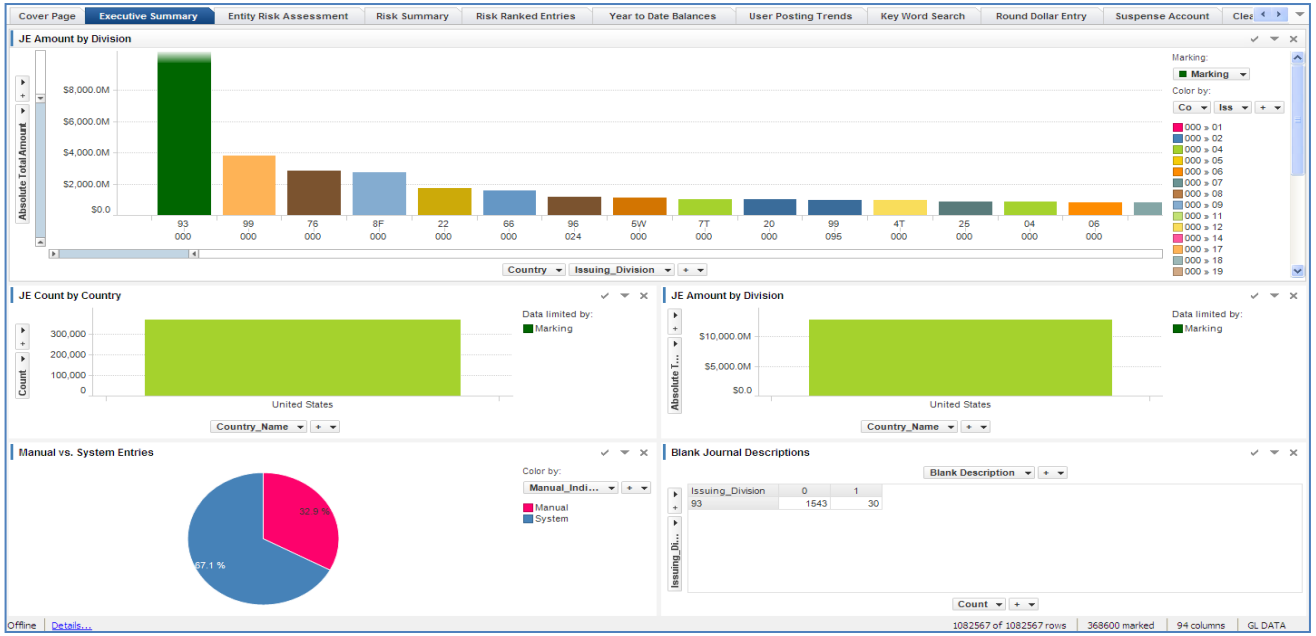
Infrastructure & Operations
- Robust "playbook" of standardized applications/routines developed and operational
- Continuous improvement and assessment of toolsets
- Quality assurance program assessing quality and usage of analytics
- Use of analytics fully embedded into the audit process

Analytics for continuous controls monitoring

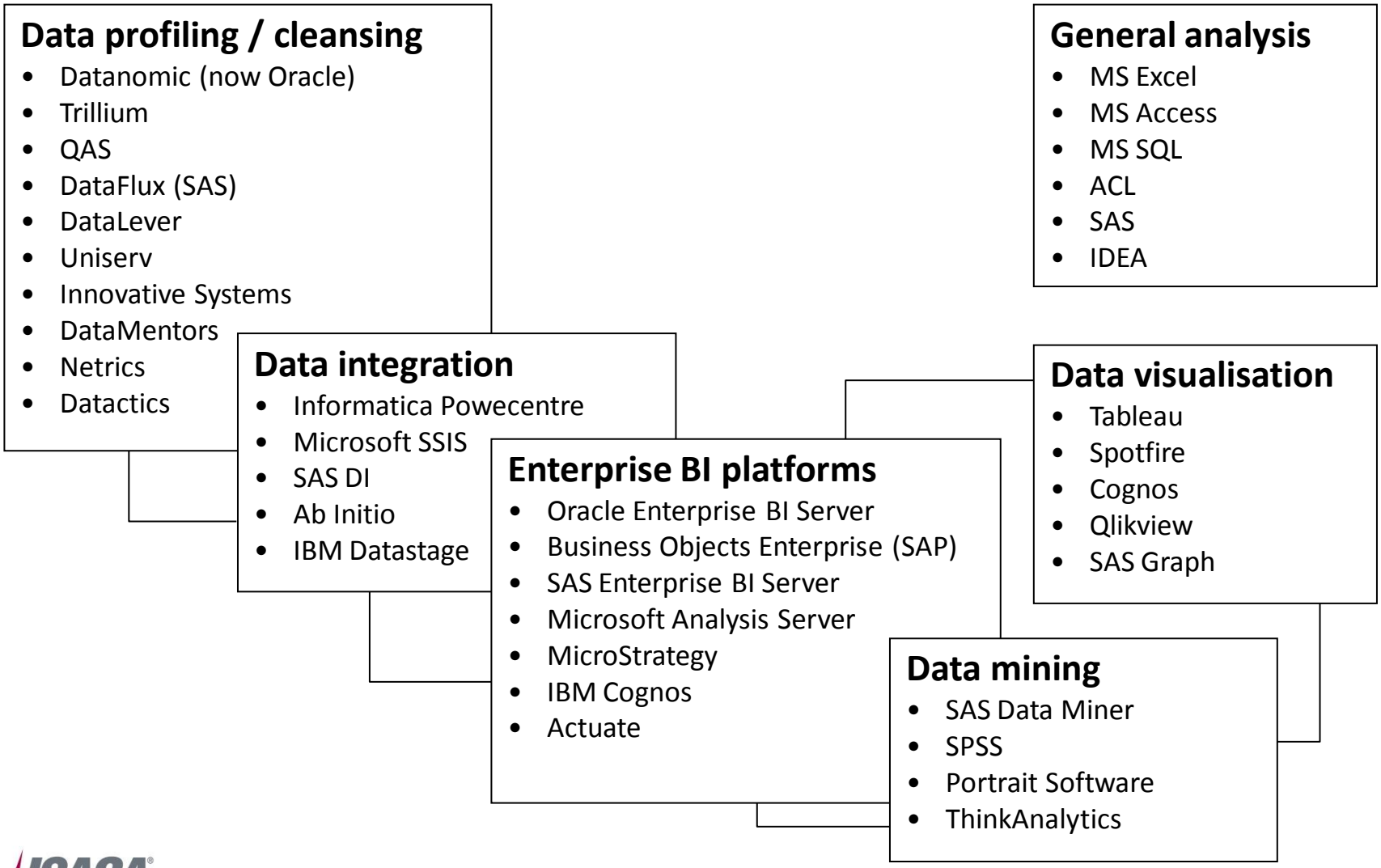


Executive reporting & dashboards

- Executive reporting and dashboards have been used for a number of years to present information to decision makers within organizations.
- On most occasions these dashboards have been prepared manually using presentation software, and/or have limited dynamic graphing functionality.
- Developments in technology have allowed us to generate fully functional executive dashboards that irrespective of domain let a user navigate across several dashboards and drill down into several levels of details with a few clicks.
- This is a very powerful technique using simplistic graphs to convey complex information and scenarios.



Information management tools, data quality tools



4. WHAT NEXT?

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Analytics industry trends

Takeaways from 2012 EY Financial Services IA Analytics Roundtable

In April 2012 leaders from Ernst & Young's Enterprise Intelligence advisory team facilitated a workshop with industry veterans and leaders, from major Asset Management, Insurance, Banking and Capital Markets companies, to address the increasingly prominent role of data analytics in internal audit operations.

The over-arching theme of the workshop was that data analytics skills are seen as valuable accelerators to internal audit operations by leaders and executors alike, but have not been effectively implemented or utilized.

Current IA Analytic Trends	Key Takeaways
1. Strategy and Framework • Inconsistent vision and/or direction for analytics • Lack of methodology and trained resources • Reliance on legacy audit and end user tools (such as ACL and Excel) for analytics	• **Formalize the analytics framework and methodology for the department** • **Develop strategic roadmap for incremental use of analytics on audits** • **Consider pros and cons of core analytics team vs. embedded resources** • **Promote visual analytic tools to minimize time and effort spent ingesting data rather than analyzing it**
2. Use in Annual and Audit Planning • Incorporated into plan roughly 60% of the time • Lightly used in driving decisions • Rarely leveraged for management reporting and substantiation of residual risk	• **Analyze prior year metrics to inform planning decisions** • **Define quantitative key performance indicators (KPIs)** • **Integrate audit risk, findings, documentation and project management data sources to gain deeper insight into current trends** • **Develop monthly, quarterly and annual reports and dashboards for management**
3. Use in Audit Execution • Mostly used for audit coverage and depth • Utilized inefficiently and only somewhat effective • Significant challenges include budget and time constraints, and unreliable sources of data	• **Build the case for analytics by quantifying risks associated with findings** • **Leverage analytics in performing pilots or proof of concept audits** • **Make analytics repeatable to gain efficiencies in executions over time** • **Incorporate data quality testing into analytics methodology** • **Enhance capabilities in controls testing in focus areas such as "trading controls"**