

A close-up, artistic photograph of a person's finger touching a digital screen. The screen displays various data analytics visualizations, including a line graph with multiple colored lines (blue, red, green) and a bar chart. The background is dark and blurred, emphasizing the interaction between the finger and the screen. The overall color palette is dominated by blues, purples, and reds, creating a high-tech, digital atmosphere.

Evolution of Internal Audit

Value creation from Data Analytics

Internal Audit - Then and Now



1950s – 1980s

- Computerized audit
- Non-statistical sampling



Early 20th century

- Manual books of accounts
- Verification of transactions
- 100% checking



1990s – 2010s

- Risk based approach
- Statistical sampling

Recent Trend

- Automated auditing tools
- Risk management
- Data analytics



Evolving role of Internal Auditor

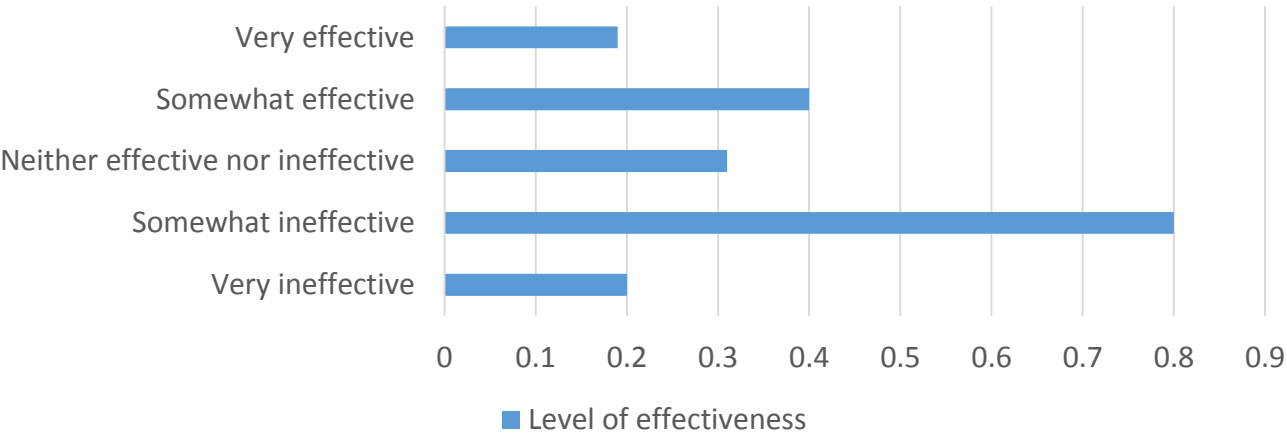


Top five improvement priorities for internal audit

The key priorities of both CAEs and stakeholders have clearly shifted from compliance and financial controls to risk coverage and business relevance. When we asked respondents about the future of their internal audit function — where they most need to make improvements — their top five priorities were:

- 1) Improving the risk assessment process
- 2) Enhancing the ability to monitor emerging risks
- 3) Becoming more relevant to achieving the organization’s business objectives
- 4) Reducing overall internal audit function costs without compromising risk coverage
- 5) Identifying opportunities for cost savings in our business

Rate of organization’s internal audit function today



Introduction to Data Analytics

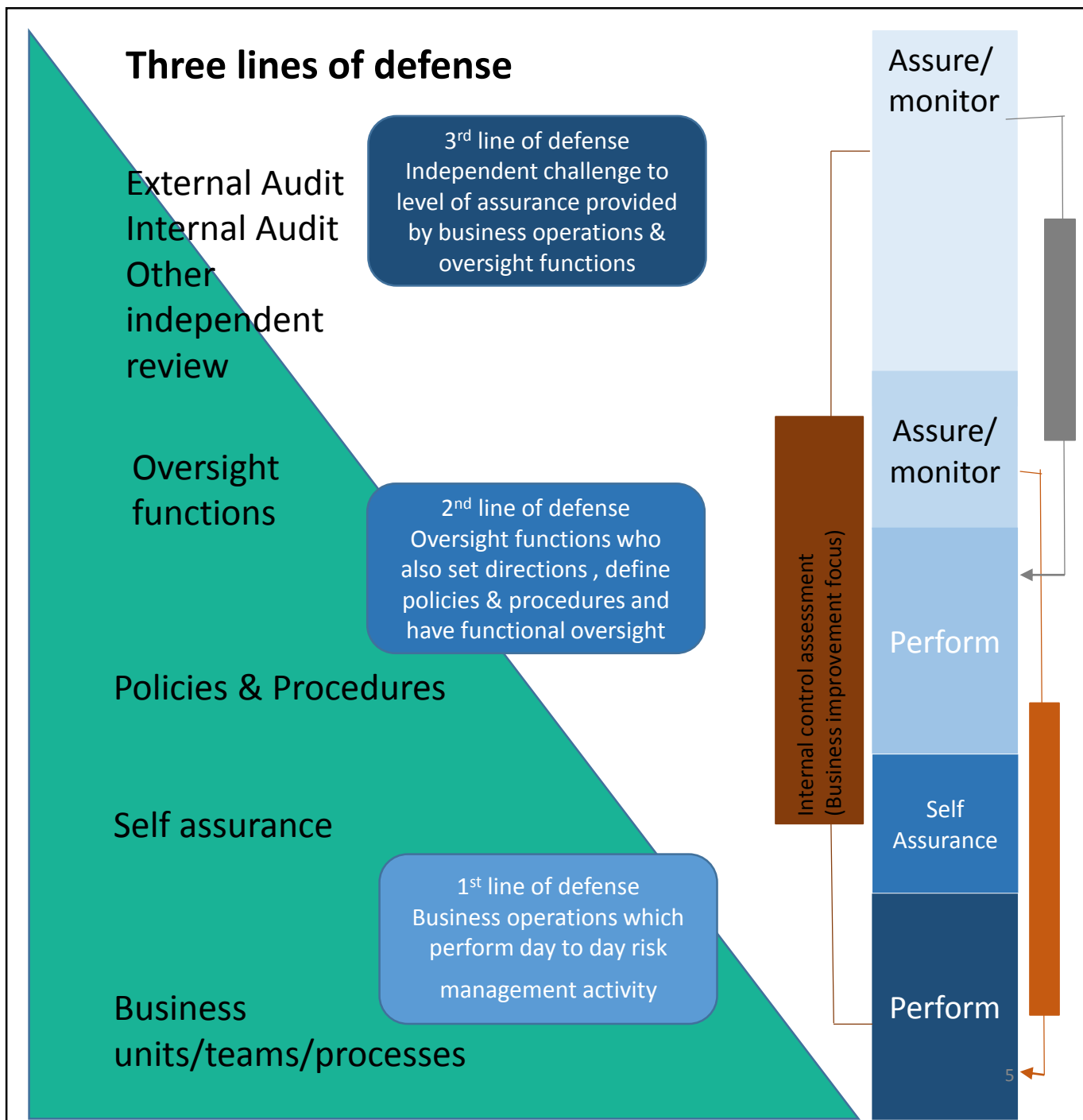
- Increasing digitization of business operations, resulting in an exponential growth in the generation of data across all business functions.
- Incorporating the use of data analytics enhances the ability to do whole population testing and continuous auditing.
- Transformation into truly risk based, continuous/real-time and data centric audit process.
- Enhances the assurance provided to the board on the management of risk and controls.



Changing Approach

“Nothing so undermines organizational change as the failure to think through the losses people face.”

-William Bridges (Harvard University)





Past

Need of the hour

Traditionally focus was on Financial Data

Focus shifted from regulatory compliance to building governance structure

**Recommendation were noted.
Waiting management to take actions**

Take actions , spearheading change and improvements.

Control testing

Implementation of three lines of defense

Key Controls

Key controls, Non key controls, Soft controls

Finance knowledge

Broaden skill set, business knowledge, awareness of technology related risks

Testing

Data Analysis

PLANNING & RISK ASSESSMENT



- Analytical tools now makes it **possible to mine data** and assess the results from different angles and perspectives
- Establish **new relationships, patterns and correlations.**
- Helps IA leaders to **understand and identify potential risks and opportunities** farther into the future. ⁷

USE OF DATA THROUGH THE AUDIT LIFECYCLE



- Identify potential analytics
- Extract, transform, load data, and Analyze data: compare, profile, visualize
- Brainstorm with audit team and develop testing hypothesis
- Audit sampling, continue to support and iterate on hypothesis
- Visualize and story board results



FIELDWORK



- Testing & validation: Defining, developing, and implementing quality assurance practices and procedures
- SQL querying: Querying and manipulating data to facilitate the solving of more complex problems.
- Data modeling: Structuring data to enable the analysis of information
- Data analytics: Valuating data using analytical and logical reasoning for the discovery of insight, e.g. predictive modeling.
- Reporting software: Understanding of the underlying theory and application of key reporting software.



Data Strategy



Becoming analytics-enabled relies on the fundamental building blocks of people, process, data, and technology, all being informed by an analytics strategy.

Process	People	Technology - selection & deployment
<ul style="list-style-type: none">• Right time to identify analytics project• Impact of this change• Steps to be taken to extract and load data timely• Measure progress and capture lessons learned	<ul style="list-style-type: none">• Who is the accountable IA owner• Type of organizational structure required• Engage with other departments• Training requirements	<ul style="list-style-type: none">• Technologies to process and present results• Scalable tools and support long-term visions• Collaboration with IT• Technical support available

RECOGNIZE THE LANDSCAPE OF TOOLS APPLICABLE TO DATA AUDITING



Desktop Tools

Eg. Excel

- Most organisations have this tool and its use for data analytics within internal audit is widespread;

Specialised Tools

Eg. SPSS, Tableau

- These enable a wider range of tasks such as info-graphics and are compatible with usage in other parts of the organisation;

Audit Specific tools

Eg. ACL, Teammate

- These enable advanced analytics but require investment and training.

Enterprise Tools

Eg. SAP, Oracle

- These tools can be used by audit functions but users need some data science skills and knowledge e.g. scripting.



A night-time photograph of the Dubai skyline, featuring several illuminated skyscrapers like the Burj Khalifa and Burj Dubai, with their lights reflecting in the water in the foreground.

TRANSFORMATION

**IDENTIFY AREAS WITHIN YOUR EXISTING IA
FUNCTION THAT CAN BE IMPROVED VIA DATA
ANALYTICS**



Procurement Process

- Evaluate expense reports and purchase card usage.
- Perform supplier audits by utilising line-item billing data.
- potential false suppliers, and related parties or employee-supplier relationships.

Descriptive Analysis



- forecast spend, based on anticipated changes in the business
- pricing forecast based on external factors.
- Per employee purchase behaviour

Predictive Analysis



- What, when and how much to reorder

Prescriptive Analysis





Finance & Accounts

- payment timing, forgone early-payment discounts and payment efficiency.
- Perform duplicate payment analysis and recovery.
- Perform revenue-assurance analysis.
- control account reconciliations.

Descriptive Analysis



- **Invoice analysis**
- **Foreign exchange risk management**
- **Sales forecasting**
- **Fraud prevention**
- **Liquidity forecasting**
- **Projected cash flows**

Predictive Analysis



- Source of finance – debt or equity?
- Segment analysis (profitability)

Prescriptive Analysis





Sales & Marketing

- Sales growth ratio (YTD)
- categorize customers by their likely product preferences and sales cycle.
- Product performance
- Lead conversion rate
- Stock turnover ratio

Descriptive Analysis



- Set sales target
- Market trend analysis
- Cannibalisation rate
- Sales per rep: Analytics of composition of sales team.
- Sales by region

Predictive Analysis



- Average purchase value: purchases per customer
- Risk associated with each opportunity
- Trade promotion optimization
- Product assortment optimization
- Sales marketing mix

Prescriptive Analysis





Human Resources & Payroll

- Identify ghost employees
- Retention risk
- training cost

Descriptive Analysis



- Learning curve analysis
- Expected attrition rate
- Personality & future work performance
- Employee succession rate
- Expected machine hours

Predictive Analysis



- Areas of improvement in workforce
- Optimum overtime

Prescriptive Analysis





Inventory & Logistics

- Perform slow-moving inventory analysis.
- Stock turnover ratio
- Key products (segmentation)
- Customer-product mix

Descriptive Analysis



- Expected sales growth
- Expected material consumption per unit
- Expected lead time
- Inventory obsolescence

Predictive Analysis



- Shipment strategy
- New product launch
- Setting up new production facilities
- New offers to customers

Prescriptive Analysis





Compliance

- Directive e.g. code of conduct.
- Preventative e.g. passwords, access controls.
- Perform segregation of duties analysis.
- Perform user access analysis.

Descriptive Analysis



- Anticipatory e.g. business continuity plan.
- identify potential outliers that would indicate control failures or weaknesses.

Predictive Analysis



- Effective risk management
- Risk based alerts

Prescriptive Analysis





PLAN AROUND ROADBLOCKS

- Limited resources (financial and human) to execute on a sustained basis
- Traditionalist mindset of the audit committee
- Skillsets and hiring the right people
- Data quality and availability
- Lack of focus – i.e. trying to do everything at once!

