

*Adding insight to audit*  
Transforming internal audit  
through data analytics





# Why analytics? Why now?

Traditional internal audit methodologies have served their purpose well for decades. However, as the business landscape for most organizations becomes increasingly complex and fast paced, there is a movement toward leveraging advanced business analytic techniques to refine the focus on risk and derive deeper insights into the organization. Leading internal audit functions are embracing recent enhancements in data mining technology and data visualization tools to deliver results more dynamically in response to risk, dive deeper into organizational data, and deliver profound fact-based insights. Business analytics holds incredible promise to enhance the internal audit process. Key to delivering on this promise is asking the right questions, embedding analytics into the culture of the internal audit function, and aligning the analytics implementation with the planning process and overall organizational operational and strategic objectives.



Before analytics can be successfully implemented, however, it is critical to understand what analytics is – and isn't. Analytics is not a technology; it's a concept. It refers to the use of certain technologies, skill sets, and processes for the exploration, evaluation, and investigation of business operations. It can be used to drive planning, gain insight, and optimize the internal audit lifecycle. The practice of analytics makes extensive use of data, statistical and quantitative analysis, explanatory and predictive modeling, and fact-based management to drive decision making. There are several disciplines contained within the scope of an analytics initiative: analytics methodology, analysis tools, performance management, descriptive statistics, exploratory data analysis, confirmatory data analysis, as well as data management. Used together, the disciplines of analytics provide hindsight, insight, and foresight.

There are several factors that have really fueled the rise in the use of analytics in internal audit functions. The first is the explosion of data volumes – both structured and unstructured. With this explosion have come innovations in the capture of, and reporting on, that data. The next is the increasing expectations of key stakeholders vis-à-vis the nature and value of reported information that the internal audit process produces. As the business environment grows increasingly complex, stakeholders require deeper insights and clearly stated facts to support decisions, build greater value, and create a more dynamic focus on risk.

Another factor driving the adoption of analytics in the internal audit process is the limitations inherent in traditional techniques. Historically and even today, techniques rely heavily on sampling data resident in enterprise systems, thereby only providing the capability for episodic, retrospective, and limited views of exceptions, control breakdowns, or risk. In today's more complex environment, however, it's essential to dive deeper into organizational data to capture all relevant facts for analysis – not just samples that might not accurately reflect the underlying reality or risks. Analytics can evolve the internal audit process from episodic to more forward-looking dynamic and continuous reviews.

Analytics – which is already used in many areas of the business, such as finance, workforce management, supply chain management, and customer relationship management – can help meet these expectations. Applying analytics to the internal audit process can facilitate moving beyond the traditional internal audit activities toward an environment of more sophisticated risk analysis and monitoring. By leveraging the power of analytics, the internal audit process can produce insights and conclusions that help decision makers take action quickly and make more effective, timely decisions.

# The business case for audit analytics

Analytics provides answers to decision makers from three perspectives: historical, current, and future—i.e., it provides hindsight, insight, and foresight. It can help users ask such questions as, “What happened, and why?”, “Where is the problem, and what actions do I need to take to solve it?”, “What will happen if these trends continue?”, and finally, and perhaps most importantly, “What’s the best/worst that could happen?” This predictive capability of analytics supports the shift toward dynamic risk-focused audit planning and audit execution over static traditional planning approaches.

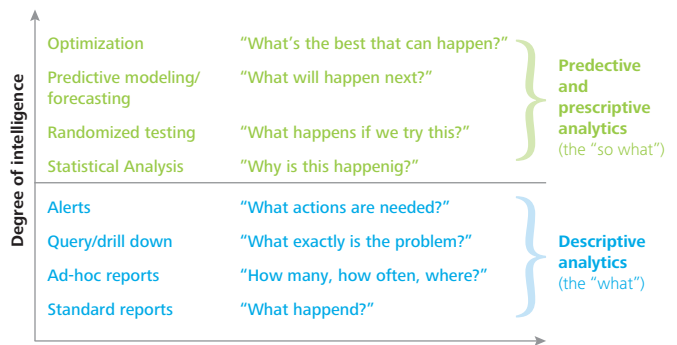
Perhaps one of the biggest challenges that the internal audit process faces today is the expectations of the C-suite and Audit Committee, that Internal Audit should support the business by delivering deeper insight and greater value more efficiently and effectively. Some of the more challenging expectations of Internal Audit include:

- Being more efficient and achieving more with less
- More effectively identifying and responding to risk
- Delivering more robust and effective analysis of key issues
- Providing more meaningful actionable insights
- Driving change within the business

The solution to these challenges lies in the application of analytic techniques to the internal audit process. Indeed, we believe that analytics will be transformational for Internal Audit. One example of this is the use of analytic techniques to evaluate compliance with controls, business rules, and organizational policies that can deliver long-term cost savings and increase audit efficiency. This allows

internal auditors to focus their efforts away from manual auditing processes and toward the areas of greatest benefit to the organization. By applying analytic tools and techniques, internal auditors can help their business partners obtain deeper insight into their data, systems, and processes and gain the ability to ask – and answer – new and more complex questions about their business. They can move from asking “What do we need to do?” to “What do we need to know?”

**Figure 1: The value of information**



The shift is subtle, but powerful. For example, instead of simply asking about what happened, companies that employ analytics can look forward and gain insight and foresight into what might happen, and they can formulate new questions to ask in order to get the information they need to model the future. They can accomplish this by using their data, coupled with simple analytics tools, to build models and perform scenario or “what if” analysis.

# Benefits of analytics applied to Internal Audit

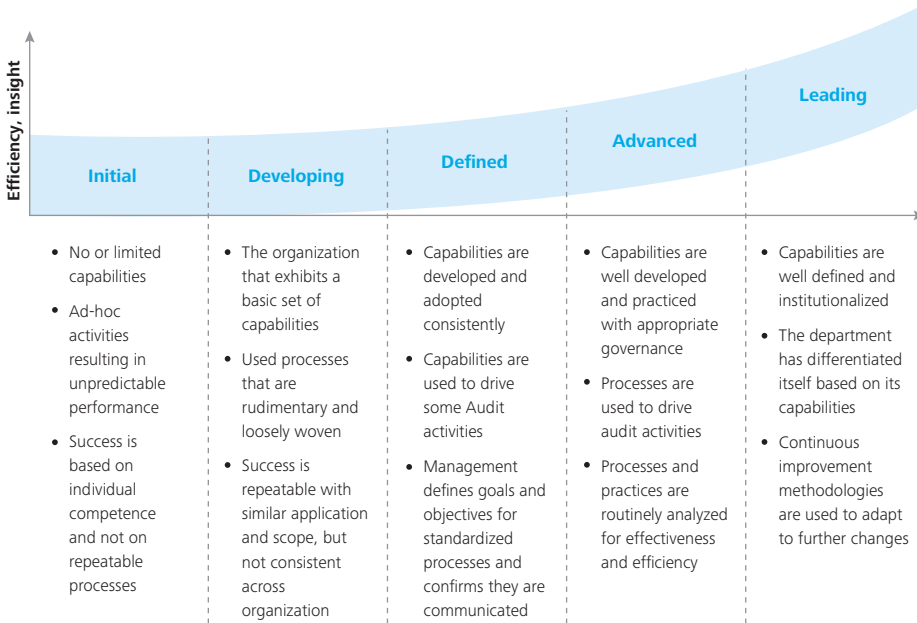
Leading organizations are deriving a wealth of benefits through the application of analytics to the internal audit process. These benefits include new and deeper operational and strategic insights gained through using analytic tools and techniques to answer questions about what is happening – and what might happen – in an increasingly complex environment. Using analytic technologies, internal audit teams can enhance value delivered by driving down cost, while expanding audit coverage and improving the focus on risk. In the process, audit efficiency is dramatically improved.

The process of integrating analytics into the internal audit process is one of continuous improvement. Figure 2 represents an illustrative maturity model for Internal Audit analytics.

Risk management is one of the leading areas in which organizations choose to apply analytics. Analytics provides better “radar” on risk via the application of exploratory and predictive techniques, as well as through the automation of routines that speed up the evaluation of risk. This ability to focus intensely on more complex and significant risks helps companies identify and address current and emerging risks more quickly, and it provides them with more – and more timely – information that can be used to make decisions and take action to raise and report those risks. This, in turn, gives management the ability to monitor and mitigate these risks promptly, and to execute more timely quantitative and qualitative risk-related decisions.

Companies that implement analytics in the internal audit process can use the enhanced information and decision-making capabilities analytics provides to move away from episodic static plans to dynamic planning utilizing continuous monitoring and predictive modeling approaches. That is, they can optimize resource allocations as needed, and they can view potential problems in greater depth to move from reactive to proactive decision making. Analytics also provides companies with the ability to perform the internal audit process with lower costs through the use of automation. By using analytics to automate the more routine activities of the internal audit process and to dive more deeply into the more complex internal audit issues, companies can perform more timely and less costly testing of compliance with policies, procedures, and regulations.

Figure 2: A maturity model for audit analytics



# Analytics applied

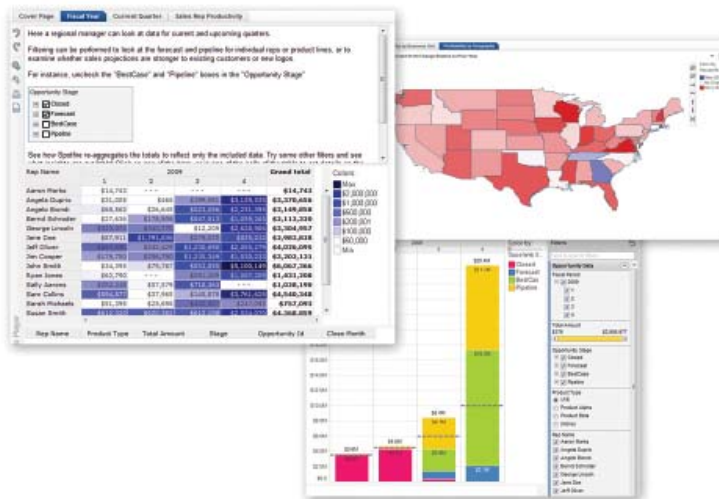
Internal auditors and their business counterparts increasingly need to see the data. Data is the basis for decision making and spreadsheets are no longer sufficient tools to get the point across; analysts need color, shape, and movement in space and time. Various technologies are available today that put information into the hands of the user – the goal is to bring the analysis closer to the decision makers.

A great example of this is the application of inductive analytics delivered via a Self Organizing Map (SOM). Techniques that utilize SOMs, and other clustering schemes, can be employed against a wide variety of variables to categorize benchmarks for audit entities within the organization. Anomaly detection algorithms based on neural network techniques can then be applied to examine entities that are risk outliers to these benchmarks within their categories.

Analysis of this nature will highlight behavioral outliers and help direct audit activity toward areas of greatest risk. This is a particularly effective analysis for risk across geographic locations and overseas operations, but it has also been used to analyze areas as diverse as revenue leakage and occupational health and safety risk.

Another example where analytics can be applied is in fraud detection and exception identification algorithms; these are often based upon anomaly detection schemes. Myriad techniques can be employed from logical risk scoring to decision trees to stochastic link analysis. Applying these techniques in combination detects transactions that are the most likely to exhibit fraudulent or exceptional characteristics. Further automating and scheduling these routines helps Internal Audit to move toward automated detection and exception-based auditing.

Figure 3: Dashboards over sustainable analytics





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The final challenge:  
Sustaining analytics  
going forward

As the application of continuous monitoring to the internal audit process illustrates, analytics is a journey, not a destination. Organizations that have mastered applying analytics to support enhanced process efficiency, analysis, and decision making can extend the power of analytics to attain ongoing competency. This can be achieved by applying the seven principles of sustainable analytics. These principles, listed below, help to accelerate the adoption of analytics throughout the enterprise and capture the value of organizational data.

1. **Start where you are** Assess your current capabilities, and get a clear picture of the gaps. Focus on low-hanging fruit and develop a long-term analytics road map.
2. **Ask “crunchy” questions** Know which questions matter most to your industry, strategy, and priorities.
3. **Enhance signal detection** Detecting and responding to signals better and faster are the keys to achieving competitive advantage.
4. **Accelerate insights through automation** Automate delivery of the information – to management, operational, and analytical processes.
5. **Engage and visualize** Output must deliver insights people need – in whatever forms required – to make fact-based decisions.
6. **Develop a fact-driven culture** Embed analytics capabilities into decision-making processes matching your approach with your style.
7. **Practice “right-fit” analytics** Match statistical and analytics techniques to the job at hand.

Sustainable analytics is a journey, not a project. If organizations are to truly sustain their analytics efforts, they should be ready for, and embrace, change. Analytics must be woven into the very fiber of the organization. Analytics tools and technologies must support and be embedded in high-impact areas that drive value. It’s also important to listen to all available signals that flow into the organization on a daily basis and use information from those signals to deliver hindsight, insight, and foresight to understand what’s really happening across the enterprise.

Management must be able to think outside the box when problem-solving. They must ask the right questions, and they must be willing to use new inputs and weigh facts against gut feelings when making decisions. Finally, analytics tools and technologies must align with and support the overall organizational strategic direction, and they must help the organization recognize, confront, and manage the challenges and constraints that inhibit growth and performance.

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