

● ● ● DATA ANALYSIS:

THE CORNERSTONE OF EFFECTIVE  
INTERNAL AUDITING



A CaseWare IDEA Research Report



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TABLE OF CONTENTS

Why Data Analysis? ..... 1

Step 1: Foundation – Fix Any “Cracks” First ..... 5

Step 2: Risk – Where to Look ..... 6

Step 3: Response – What Needs to be Done ..... 7

Step 4: Resources – Auditing Readiness ..... 8

Step 5: Model – Systematic and Disciplined ..... 9

Step 6: Monitor and Improve – Stay on Track ..... 10

Conclusion ..... 11

Tests of Controls Using Data Analysis Software Can Stop or Quickly Detect Fraud ..... 12

## WHY DATA ANALYSIS?

Clients, customers and investors alike have little tolerance when controls fail to reveal erroneous data used in operational decisions and financial reporting. Undetected errors in systems and data can also yield opportunities for fraud and abuse. The best tool that can be used to determine the reliability and integrity of information systems is data analysis software.

Audit results gleaned from competent data analysis activities by internal audit can shine a light on the issues lying within the organization's data. Therefore, audit leaders must focus on making certain every staff member understands the client systems, and knows how to acquire and analyze the data produced by these systems in order to corroborate or detect failures in the reliability and integrity of the system information.

When properly used by trained staff, data analysis software can be incorporated into audit plans to provide assurance and consulting services related to the organization's information systems and thus becomes the true cornerstone of an effective audit foundation.

Does your audit organization embrace the use of data analysis as the cornerstone of effective internal auditing? Consider the points presented below and how they relate to excerpts from the IIA Professional Practices Framework as shown in Table 1.

### **How effective is your Auditing Function?**

1. Has internal auditing established a strong foundation?
  - A strong foundation is in place
  - Maintain a broad scope of authority
  - Benchmarks indicate progress and success
2. Do you know where information risk exists within your company?
  - Establish an appropriate risk-based methodology
  - Create an inventory of all business information systems
  - Document data life cycle for each system
  - Document permission levels
3. What response does internal audit have to data reliability issues within your organization?
  - Extensive/moderate analysis and data mining assurance role
  - Minimal analysis and data mining assurance role
  - Consulting role
4. Does internal audit have appropriate resources to properly conduct data analysis?
  - Ability to obtain corporate data
  - Appropriate levels of staff involvement
  - Skills and competencies assessed
  - Effective and efficient tools are in place

- 5. Have you implemented a systematic and disciplined model for your staff to follow?
  - Acquiring and importing data
  - Validation
  - Analysis
  - Supervision
  - Documentation
  - Sharing Experiences
  
- 6. Do you monitor and improve internal audit's performance to manage strengths and/or weaknesses?
  - Performance
  - Continuous Improvement
  - Testing and results are tracked
  - Analysis of experiences – failures and successes
  - Visibility in the business units creates more opportunities

..... **TABLE I** .....

Depending on your observations to these points, you might want to consider the following critical elements of the IIA Professional Practices Framework and how data analysis fits in an integral way<sup>1</sup>.

The framework indicates assisting the organization in maintaining the highest level of **reliability and integrity of financial and operational information** is one of the five critical tasks internal auditing performs-2110.A2<sup>1</sup>. To accomplish this mission, internal auditors should:

- Include reliability and integrity of information in **risk assessments conducted at least annually**-2010.A1<sup>2</sup>,
- Be able to **detect the probability of significant errors, irregularities, or noncompliance**-1220.A1<sup>3</sup>,
- Have sufficient knowledge to **identify indicators of fraud**-1210.A2<sup>4</sup>,
- Be **knowledgeable of key information technology risks and controls and available technology-based audit techniques**-1210.A3<sup>5</sup>,
- **Consider the use of computer-assisted audit tools and other data analysis techniques**-1220.A2<sup>6</sup>,
- Engage only in those services for which they have the necessary **knowledge, skills, and experience**-1210<sup>7</sup>, and
- Develop and maintain a **quality assurance and improvement program** designed to provide assurance that the internal audit activity **conforms to the Standards and Code of Ethics**-1300<sup>8</sup>.

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<sup>1</sup>2110.A2 – The Internal Audit Activity should evaluate risk exposures relating to the organization's governance, operations, and information systems regarding the:

- Reliability of the financial and operational information.
- Effectiveness and efficiency of operations.
- Safeguarding of assets.
- Compliance with laws, regulations and contracts.

<sup>2</sup>2010.A1 – The internal audit activity's plan of engagements should be based on a risk assessment, undertaken at least annually. The input of senior management and the board should be considered in this process.

<sup>3</sup>1220.A1 – The internal auditor should exercise due professional care by considering the:

- Extent of work needed to achieve the engagement's objectives.
- Relative complexity, materiality, or significance of matters to which assurance procedures are applied.
- Adequacy and effectiveness of risk management, control, and governance processes.
- Probability of significant errors, irregularities, or noncompliance.
- Cost of assurance in relation to potential benefits.

<sup>4</sup>1210.A2 – The internal auditor should have sufficient knowledge to identify the indicators of fraud but is not expected to have the expertise of a person whose primary responsibility is detecting and investigating fraud.

<sup>5</sup>1210.A3 – Internal auditors should have knowledge of key information technology risks and controls and available technology-based audit techniques to perform their assigned work. However, not all internal auditors are expected to have the expertise of an internal auditor whose primary responsibility is information technology auditing.

<sup>6</sup>1220.A2 – In exercising due professional care the internal auditor should consider the use of computer-assisted audit tools and other data analysis techniques.

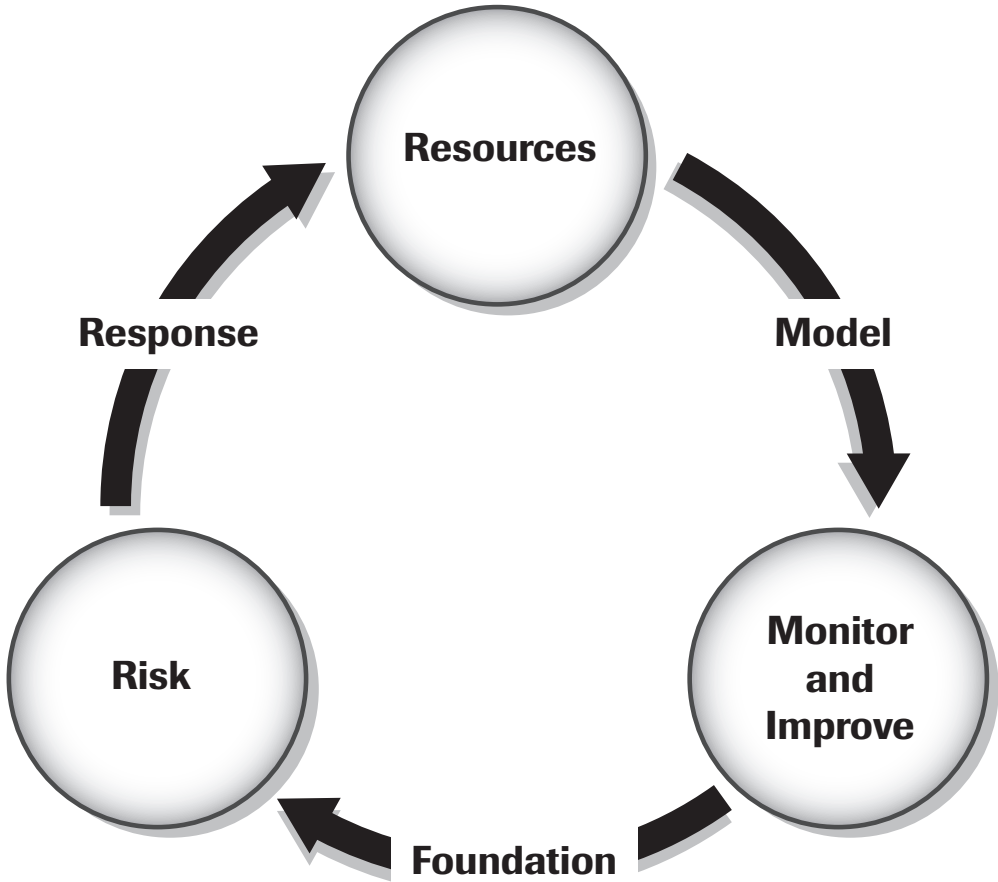
<sup>7</sup>1210 – Proficiency – Internal auditors should possess the knowledge, skills, and other competencies needed to perform their individual responsibilities. The internal audit activity collectively should possess or obtain the knowledge, skills, and other competencies needed to perform its responsibilities.

<sup>8</sup>1300 – Quality Assurance and Improvement Program – The chief audit executive should develop and maintain a quality assurance and improvement program that covers all aspects of the internal audit activity and continuously monitors its effectiveness. This program includes periodic internal and external quality assessments and ongoing internal monitoring. Each part of the program should be designed to help the internal auditing activity add value and improve the organization's operations and to provide assurance that the internal audit activity is in conformity with the Standards and the Code of Ethics.

**Six Steps for an Effective Audit Function**

Start by making certain your **foundation** is free of any “cracks”.

After you identify and correct any weaknesses in the foundational issues internal audit must address; determine the level of **risk** in decisions relying on information systems; prepare a **response** finalizing a strategy to address gaps; be sure **resources** are adequate; finalize a **model** for conducting data analysis activities; and, **monitor and improve** activities to be sure desired outcomes are reached.



## STEP 1: FOUNDATION – FIX ANY “CRACKS” FIRST

Creating an auditing function is similar to constructing the framework for a new building. There are no simple guarantees: Bigger is not always better and smaller is not automatically more efficient. Regardless of the size of the function, certain components are necessary such as:

- **A Strong Foundation**

Auditing functions do not just appear; they rise up from strong foundations – foundations with the correct combination of critical elements cemented by an iterative building process consisting of:

- Strong and effective senior level leadership
- Regular and appropriate communications with senior management
- Activities that exhibit adherence with professional standards
- A well balanced, competent and skilled professional staff
- A broad and comprehensive audit entity universe
- Audit results from properly prioritized planning activities

- **A Broad Scope of Authority**

The five critical tasks according to the professional Standards indicate internal auditing should regularly evaluate risk exposures in:

- Governance (management's policies and procedures)
- Reliability and integrity of financial and operational information
- Effectiveness and efficiency of operations
- Safeguarding of assets
- Compliance with laws, regulations and contracts

- **Indicators of Success**

The auditing leadership will know when progress is being made by realizing the following characteristics:

- Higher marks in customer satisfaction responses
- Success in attracting new auditors, as many top performing auditors like to be associated with functions that employ technology to improve effectiveness and efficiency.
- Staff confidence levels grow while turnover drops significantly
- Staff interest in investigating different and potentially better audit approaches, techniques and tools
- A strong ability to independently acquire and analyze company data to either corroborate or detect failures in reliability and integrity of information

Auditing functions built on a solid foundation not only successfully achieve their mission, but they are able to obtain the maximum benefits from effective auditing through the use of data analysis.

## STEP 2: RISK - WHERE TO LOOK

The chief auditor is responsible for conducting a risk assessment at least annually, culminating in a flexible annual audit plan of areas selected by an appropriate risk-based methodology. This plan would also include consideration of any risk or control concerns identified by management.

To specifically assess risks associated with operational and financial information, auditors will need to gather and maintain information about the types of systems used in the organization; who is the owner(s) of these systems; and, understand the level of reliance the organization places on the information from these systems. The completion of these activities can be daunting if internal audit is doing this for the first time. Subsequent updates are much easier.

The activities that will need to be completed and updated on an annual basis are:

- **Risk-based Methodology**  
Establish an appropriate risk-based methodology that will facilitate setting audit priorities based on probability of occurrence and impact. You can develop your own, borrow from another organization or buy one. If you have an automated audit assistant or workpaper system, a risk assessment methodology may be an included function.
- **Business Information Systems**  
Create an inventory of all current and future business information systems. The level of detail captured for each system should complement the assessment process. Discussions with the business units that own and maintain each system should disclose if specific issues or problems arise from the use of these systems.
- **Data Life Cycles**  
Document the data life cycle for each system. Include the source of data and how it is collected; where and how data is stored and backed-up; what key business decisions are made using the data; and, how the data is distributed including retention and destruction. Be alert to the separation of duties issues.
- **System Permission Levels**  
Document the permission levels granted to specific employees or groups of employees in each system. Include the process of how permissions are granted and changed over time. This is an excellent area where data analysis scripts can be established to continuously read in current data and provide a matrix of users by permission level, time of day or day of the week of the specific systems.

Upon completion of these activities, the auditing function may have already identified opportunities for improvement. If so, auditing should initiate formal discussions with management, agree on the concerns identified and develop corrective actions.

## STEP 3: RESPONSE – WHAT NEEDS TO BE DONE

The *Standards* indicate internal audit, at a minimum, has a responsibility to uncover significant errors, irregularities or noncompliance as well as be alert for indicators of fraud. Proper use and application of data analysis can assist in fulfilling these duties. If data used by the organization to conduct business is not reliable, then management could be making wrong decisions or taking actions that do not enhance the efficiencies and effectiveness of operations.

If the risk assessment in Step 2 discloses significant gaps in management monitoring activities, the auditing response may be more proactive. The response level most likely will be different for each data table, as follows:

- **Extensive or Moderate Assurance**

If the risk assessment indicates controls are inadequate or non-existent, based on frequency and/or impact of issues, then more in-depth assurance work is warranted. The auditing team will need to establish a dialogue with the system owner(s) to gain concurrence. Data analysis activities should be conducted frequently to search for errors and irregularities, and the tests can be used by the operating units to help them improve their controls.

- **Minimal Assurance**

The risk assessment may reveal that minimal or no gaps exist and/or an independent area is actively monitoring information integrity and reliability. If so, auditing will need to verify this is the case by conducting sufficient work to rule out significant errors or indicators of fraud.

- **Consulting**

Some organizations would benefit more from having auditing serve a consulting role and participate more in helping management assess the risks of new strategic initiatives, perform due diligence and other projects.

Depending on the response, the chief auditor should re-visit the role of internal audit as stated in the Internal Audit Charter and recommend changes where necessary. Discussions with senior management, external audit and the board audit committee will most likely need to be conducted if changes are anticipated. The chief auditor should also make certain that the organization is informed of internal audit's role in all critical areas, including data analysis and data mining initiatives.

The opportunity for better auditing tools and skills and the need to increase data analysis and data mining coverage, converges in internal audit. This perception will cause the chief auditor to realize such competencies can go beyond compliance with the *Standards*. By using data analysis or data mining tools internal audit can achieve better audit results and lower audit cycle times.

## STEP 4: RESOURCES - AUDITING READINESS

The chief auditor should ensure auditing resources are appropriate, sufficient, and effectively deployed to achieve the approved plan, including communicating the impact of resource limitations (see *IIA Standards 2020* and *2030*). Resource deficiencies can become “barriers” to success. Resolving resource issues before obtaining the Annual Audit Plan approval will improve the successful roll-out of data analysis processes. Areas to consider are:

- **Obtain Corporate Data**  
Auditing activities will not be successful in completing the audit plan if problems arise in acquiring data. Review and become familiar with the organization's policy on data access permissions and privileges (and if one does not exist, find out why).
- **Staff Involvement**  
Will data analysis activities be assigned to IT auditors, financial auditors or the full staff? Chief auditors usually do not start out with a goal of 100% competency. Most functions start out with a relatively smaller goal and each year, as successes and skills improve, add staff to the role.
- **Assess Skills and Competencies**  
If auditors on staff have some experience, they can act as a catalyst to assist others. Other sources for training are: from within the organization; on-site training by an outside provider; sending employees off-site; or, acquiring new staff with the skills.
- **Acquire Effective and Efficient Tools**  
Look for the tools that auditing may already own but are only used by a few. Use of general office tools is common because they are readily available. However, be warned that these tools can easily be overwhelmed by simple auditing techniques such as acquiring, merging, sorting and sampling data. Current advanced data analysis tools have a history of successful integration of auditing needs and requirements and therefore, allow staff to be very effective and efficient with minimal training. If new tools or additional tools are necessary, plan to acquire software with a good reputation for ease of learning, ease of use and reliable technical and customer support. Resource needs should include software purchase plus initial training if needed.

Defining resources such as tools and talent, plus the budget to acquire and maintain the level of appropriate activities, will move the function towards effective status. Skill sets to acquire or develop that complement the use of data analysis tools should include critical thinking skills and an understanding of information systems and relational databases.

## STEP 5: MODEL - SYSTEMATIC AND DISCIPLINED

Establishing a model to be used as the basis for change, can guide the staff in getting started and avoid or at least minimize “false-starts”. Conducting some test runs against real data will help establish the most appropriate model for the staff to follow. Areas to cover are:

- **Data Acquisition and Importation**  
The staff will need to know how to get the data and the required data elements (or fields). In some organizations, the IT staff is going to require a properly completed and approved service request. Organizations that have implemented large ERP systems may provide report writers that with permission, allow auditing to obtain direct access to data. Organizations with legacy systems can often provide standard reports in electronic format as a “print report”. These can easily be imported into the data analysis tool for verification and analysis.
- **Validation**  
Data should be tested for completeness and accuracy. The data should agree to a specific company report; financial results or statements; or as a comparison to same period last year or current year budget. Any variances should be resolved before moving forward.
- **Analysis**  
Analysis comprises a vast array of activities from merging and joining data files, sampling or extracting specific records, and sorting or looking for timing, gaps and irregular data patterns. The analysis becomes the support for conclusions.
- **Supervision**  
The Standards require that adequate and appropriate supervision of work be conducted. Directions should be established as to who and how these activities will be completed. Many automated workpapers facilitate supervisory review activities and functions.
- **Documentation**  
Auditing must maintain good trails and histories of analysis activities to support audit conclusions. The client must be assured that the auditing work did not introduce data integrity and reliability issues into the workpapers. Auditing-specific data analysis tools for auditors should include an automated history log.
- **Sharing Experiences**  
Some auditing functions conduct a closing conference on the data analysis activities shortly after the final audit report is issued. This sharing of experiences can benefit both auditors and management alike. Open discussion on what worked and did not work can help strengthen monitoring activities and future auditing work.

The model will assist in keeping the auditing function organized. In the event the auditing team's instincts are alerted, reasonable additional tests could be conducted that may identify previously undetected issues, i.e., data failures and fraud.

## STEP 6: MONITOR AND IMPROVE - STAY ON TRACK

Leaders of the auditing function must periodically monitor activities to be sure maximum benefits are obtained. This is very important if new audit tools and methodologies have been introduced. Monitoring also provides the opportunity for leaders to voice their support of the work and accomplishments to the function. Key areas are:

- **Performance**  
Clear expectations of effectiveness and efficiency goals should be identified, communicated and monitored. The rule of thumb of less costly, faster and better should be applied to audit work. Controls to identify where opportunities were overlooked or where performance lagged behind expectations, should be implemented.
- **Continuous Improvement**  
The staff should always be looking for new and better ways of conducting activities and audit work. Building on the knowledge of the company and industry as well as the tools and techniques used by other auditors is very important. A good source for new ideas may be obtained by attending user group and professional association meetings.
- **Tracking**  
Internal audit should develop a process for formally cataloging analysis and test results. This library is really an asset of internal audit and can be used to drive improvements and demonstrate successes.
- **Analysis of Experiences**  
When indicators suggest changes are required, fine-tuning of performance expectations, benchmarks and progress indicators may be necessary. A good source for new ideas may be obtained by attending user group and professional association meetings.
- **Spread the Word**  
Auditing should use successes as internal “marketing” sources. This demonstrates the pride leaders have in auditing successes and may also encourage other departments to look to auditing for assistance with data problems. Helping management achieve company goals can facilitate better audits down the road.

While monitoring helps the audit function and staff stay on track, it also becomes the start of that iterative process that builds success for the department and the entire organization. Staff see that their endeavors are receiving the proper notice, which helps build pride and improves morale throughout the audit department.

## CONCLUSION

These six steps will help your function become a more effective and valuable resource for control and operational efficiency issues as they arise in the organization. Auditors will be seen as strategic partners in helping the organization achieve its goals. The data analysis tools and techniques used by the auditing function can be transferable to business units and can enable them to perform self-assessments and improve their controls. This benefits the entire organization as audit moves to more consultative roles, documenting confidence that the organization does the right things the right ways. When audit departments function in a way that causes personnel throughout the organization to be assured that their financial and operational data is reliable for good decision making and trustworthy financial reporting, truly effective internal auditing has been accomplished.

## References

- <sup>1.</sup> Institute of Internal Auditors, International Professional Practices Framework, 2004  
Institute of Internal Auditors, Council of Sponsoring Organizations, “Tone at the Top”

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## TESTS OF CONTROLS USING DATA ANALYSIS SOFTWARE CAN STOP OR QUICKLY DETECT FRAUD

- **Auditors to Review Time Sheets**  
Concerns about how employees log time off has sparked an audit of all departments. Inconsistencies were discovered when several employees claimed they worked 8 hour days when in fact they took the days off.
- **Audit Finds Possible Ghost Employee**  
A payroll audit turned up a ghost employee resulting in termination of one executive and others interviewed.
- **Audit Detects \$1 Million Missing**  
A financial officer with sole responsibility to reconcile employee usage of company credit cards in 3 years embezzled to pay for spending sprees, cars and vacations.
- **Guilty – Top Executive Takes \$1.6 Million**  
False invoices from real vendors were submitted by one executive who then approved the payments over a 3 year period. The payments were sent to addresses and lockboxes controlled by the executive.
- **Executive To Serve 8 Years in Prison**  
An executive directed her department to issue 11 payments in one day, each one just under her \$50,000 authorization level. Services were not provided. Instead, the vendors returned the checks to her which she placed in personal bank accounts.

Sources: *Various newspaper articles during 2006*

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