



GLOBAL KNOWLEDGE BRIEF

Data Analytics

Part 2: Gathering, Understanding, and Visualizing Data



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About the Experts

Alicja Foksinska Arnold, CISA, CFE

Alicja Foksinska Arnold is a lead IT auditor at Protective Life Corporation. She spearheaded the creation of data analytics, visualization, and storytelling efforts in the organization's internal audit department, becoming the data specialist of the team. She is currently managing and maturing the newly created Data Analytics shop. Alicja is also an instructor at The University of Alabama at Birmingham (UAB), where she teaches accounting information systems and data visualization for business.

Bryant Richards, CIA, CRMA

Bryant Richards is the director of the center of intelligent process automation at Nichols College, where he is teaching and building programs to reduce the industry gap between business and technology skills. Prior to joining Nichols College, Bryant spent 20+ years in industry, mostly in internal audit and compliance. He is currently pursuing his PhD in accounting with a focus on leveraging emerging technology in internal audit.



Introduction

Data is the foundation on which every internal audit is built. As organizations increase their reliance on data to enhance products and services, internal auditors are positioned to leverage this ever-growing resource. Data analytics, robotic process automation (RPA), artificial intelligence (AI), and other tools provide practitioners accessible and valuable avenues to improve efficiency and effectiveness in assurance services and increase internal audit's value to the organization. Areas where data analytics can improve internal audit services include performance reporting, fraud prevention and detection, continuous monitoring, and risk assessment.

This Global Knowledge Brief, the second of three that focus on data analytics, explores data in its various forms, data gathering techniques, the importance of data validation, data analysis, and keys to effective storytelling with data.



Starting the Data Analytics Journey

Forms of data and new technologies

Gathering data

Internal audit provides assurance that existing internal controls are adequate to mitigate existing or unidentified risks, that governance processes are effective and efficient, and that organizational goals and objectives are met. Identifying and harnessing meaningful data is critical throughout an organization, particularly in internal auditing. The methods that the internal audit team uses may vary depending on the situation, but employing a variety of sources of information can provide better perspective and context. Approaches may include:

- Interviewing people or conducting focus groups within or outside of the areas being audited.
- Using questionnaires or checklists to collect information, including observations and opinions from people who work in or deal with the business area being audited.
- Observing the workings within a business area over a period of time to spot issues or inconsistencies.
- Vertical auditing, in which the auditor monitors one process from beginning to end to identify any issues.
- Documenting formal practices and procedures within a business area.
- Accessing informal documentation that may provide insights into ad hoc processes and procedures.

Supplemental guidance from The Institute of Internal Auditors (IIA), including [Integrated Approaches to Internal Auditing](#), provide additional insights into how to leverage data and resources to support engagements.

“While intuitively, an integrated approach to an engagement begins with setting objectives and scope, the execution of the engagement will likely require integrated audit techniques and optimizing tools, resources, and knowledge sharing. Internal auditors should use all available tools to improve the efficiency and effectiveness of their engagements,” according to the practice guide.

While approaches may vary, the underlying goal remains consistent: to gain an in-depth understanding of the culture, systems, and processes of the business area being audited.

Technology enhancements

Many new technologies are enhancing the quality and efficiency of data collection, validation, and reporting. They include:

- **Data analytics.** While this is not a new tool, improved technology has made it easier to identify, understand, and predict trends, as well as create metrics that can help optimize performance.
- **Artificial intelligence (AI).** AI can take unstructured data — information that is not neatly categorized into conventional rows and columns — and use machine learning and other tools to complete tasks that people would otherwise perform, such as problem-solving. Today, companies often handle large amounts of unstructured data in the form of information from outside sources, emails, social media posts, and more.



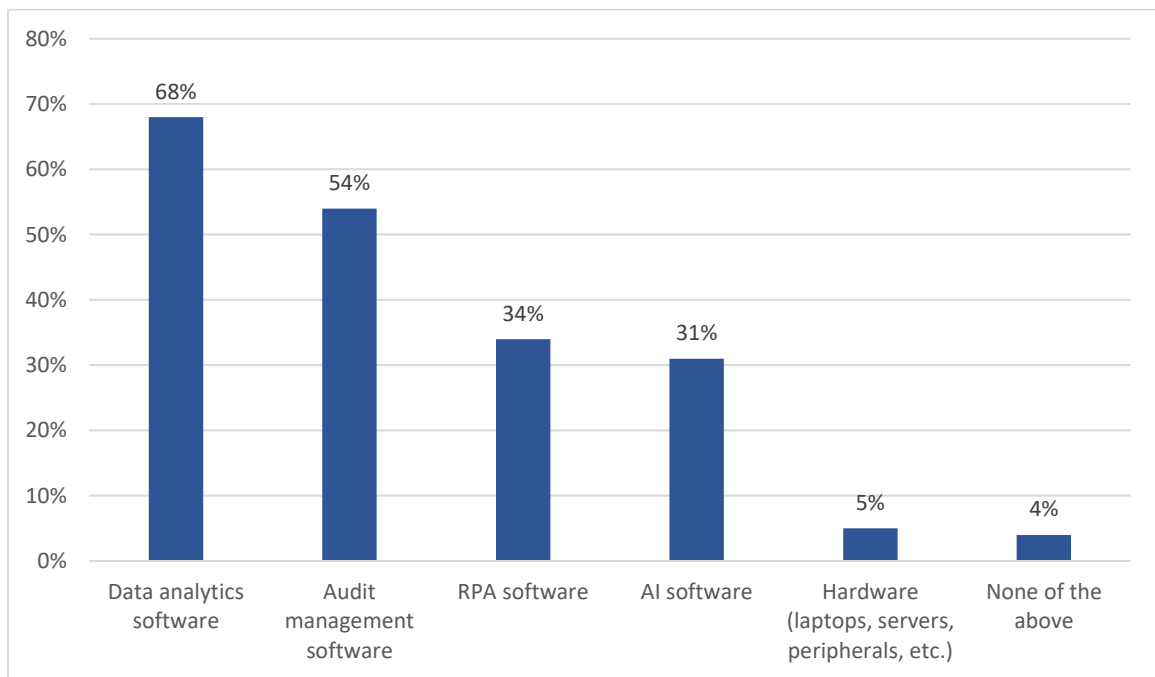
- **Robotic process automation (RPA).** RPA automates repetitive low-level tasks, freeing people to take on more demanding responsibilities. To accomplish these tasks, RPA uses structured data — information that can be easily processed by people or machines and used in conventional relational database systems.

While data may sometimes still take the same forms as it has in the past, technologies like these make it possible to enhance data validation and, ultimately, enable better decision-making.

If internal audit takes full advantage of the opportunities presented by AI and data analytics, the resulting benefits could include improved performance reporting, fraud prevention, risk-based internal audits, and continuous monitoring, said Grant Thornton UAE, Dubai Senior Consultant Muhammad Hassan Rizvi in “Data-enabled Internal Auditing,” a 2022 article published in *Internal Auditor*. “With the continuous expansion of technologies such as artificial intelligence (AI), cloud computing, and big data, organizations can now store and process more data than ever, making it easier for them to drive business strategies and decisions based on data analysis insights,” according to the article.¹

The benefits of data analytics are no secret among internal auditors. The IIA’s 2022 “North American Pulse of Internal Audit Survey” found data analytics software to be the most desired technology upgrade among CAEs (Figure 1).²

Figure 1: Focus Areas for Technology Increase



Note: The IIA’s North American Pulse of Internal Audit Survey, Oct. 5 to Nov. 9, 2021. Q22: If your internal audit function were to receive an unexpected budget increase, in which area would you primarily spend it? n = 505.

¹ “Data-enabled Internal Auditing,” Muhammad Hassan Rizvi, *Internal Auditor*, February 21, 2022.

² “2022 North American Pulse of Internal Audit: Benchmarks for Internal Audit Leaders,” The IIA, March 10, 2022,

https://www.theiia.org/en/content/research/pulse-of-internal-audit/2022/2022-north-american-pulse-of-internal-audit/?gclid=CjwKCAjwzNOaBhAcEiwAD7Tb6lcbLu44qaLU8lHJSD-kDbe5nhqtORum-O4Qiba9MVM5VdNu6n81GBoc5goQAvD_BwE.



Questions to Consider

Internal audit typically gathers information from other sources, both within and outside the organization or the business area being audited. Two important questions for auditors to consider in the data-gathering stage are:

1. *What is the best way to access information from the data source?*

It is critical for internal auditors to understand the business process being audited and what kind of data it uses and/or creates. That includes having a sense of the inputs that the data might have been subject to. For example, if there have been manual inputs to some or all of the data, it is possible for mistakes or other intentional or unintentional changes to occur. Because internal audit's conclusions and reports can only be as good as the information on which they are based, it's important to recognize such risks to data integrity.

In many cases, internal auditors request data from the business area and then audit the report they receive. However, it is preferable to secure a direct connection to data sources, such as a server database, or an application, according to Alicja Foksinska Arnold, lead IT auditor, Protective Life Corporation. This is a recommended practice because:

- On a practical level, it can minimize the time necessary to submit follow-up questions on the data to the business area that created the report.
- Having direct access to data also enhances the independence of internal audit, because it guarantees the information has not been filtered before getting to the auditors. While more internal audit functions are following this approach, it is not yet universal.

To maintain independence, internal auditors should have read-only access to the data. This allows for data to be examined without altering or editing any of the underlying numbers while allaying auditee fears relating to maintaining database integrity.

2. *How can internal auditors use technology tools to streamline tasks?*

Using RPA, internal auditors can automate frequently used and repetitive manual tasks. This makes it possible to use their output across a variety of applications. Improvements to readily available software are making it easier to import data from a variety of sources with ease. For example, while it was once necessary to load data from a PDF into an Excel file manually, it can now be done in many cases with the push of a button (Figure 2), noted Bryant Richards, CIA, director of the center for intelligent process automation at Nichols College.

In particular, he advised internal auditors to explore options for converting information into structured data, making it easier to use in a variety of applications, including visualizations. Simple automation tools need not be complex or expensive, Richards said. They include those from [NICE Automation Studio](#), [UiPath](#), and [Automation Anywhere](#). It can also be possible for a standard PDF with Excel.

45%

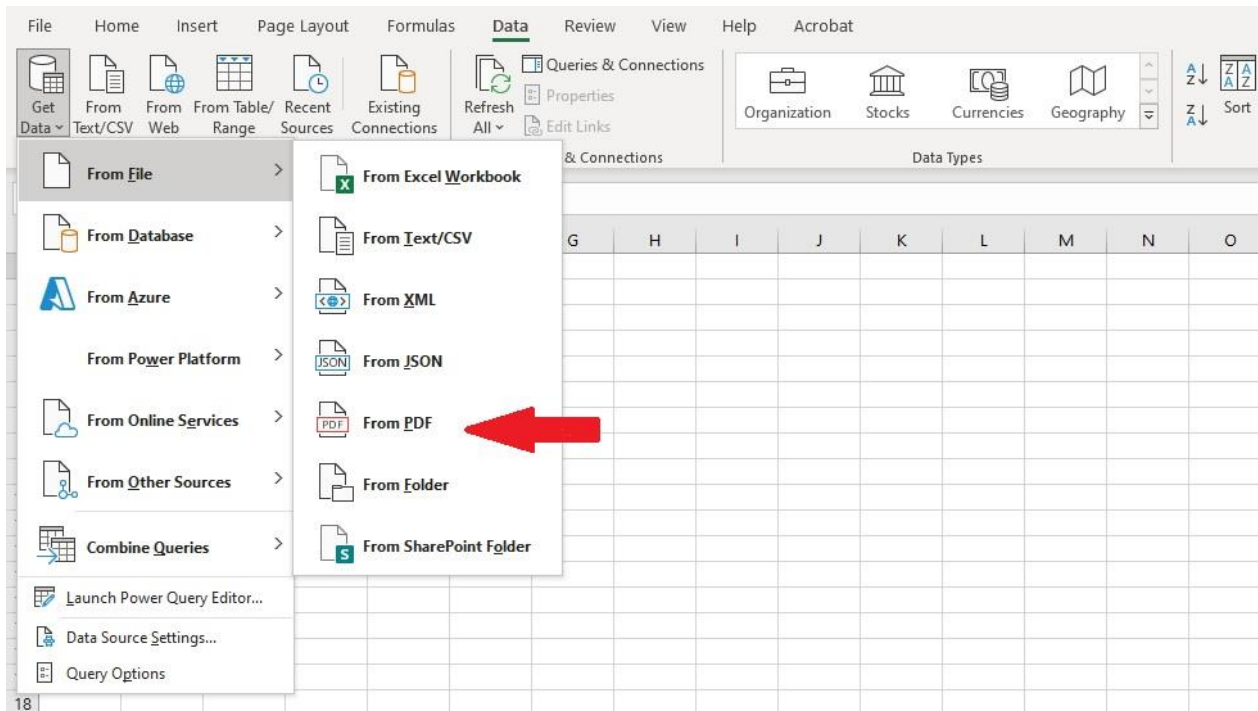
Percentage of workforce tasks that can be automated. "RPA can help internal audit increase productivity, expand its risk coverage and help address the ongoing compliance burden by doing more with less."

- PwC³

³ "Seth Rosensweig, "Robotic Process Automation: A Primer for Internal Audit Professionals," Accessed November 11, 2022, PwC.



Figure 2: Importing PDF Data Into Excel



The Importance of Data Validation

Accuracy is critical

Data flow diagrams

Accuracy and completeness are key considerations in any audit. Data validation tests the quality of information meant for use in decision-making. Data quality failures may result from duplication of records; mistakes in data collection or calculation; misuse or improper categorization of data; information tampering due to security breaches; or obsolete data, among other problems.

Steps that auditors may take in validating data include:

- Evaluating whether the data has come from a reliable source and makes sense in context with the auditors' overall understanding of the business area.
- Considering how many sources the data are derived from, as well as how long they took to obtain, to determine if these factors raise risks to data integrity.

Proper validation requires beginning each audit without preconceived notions. One potential mistake may occur when internal auditors approach an audit engagement assuming the data will show the same situations as occurred in the past. This can influence their perceptions of the data and lead to incorrect conclusions. To prevent this outcome, data should be used to perform an analysis and develop a unique story, rather than to confirm or debunk an assumption.

Validation is an important consideration at many points in the data's lifecycle. For example, Foksinska Arnold's organization frequently performs system conversions when it is scaling up its technology. In the process, data is moved from one system to another. Internal auditors should be aware that during that transfer, an accidental shift of data by one decimal point can have a significant impact on data validity and on decisions made using incorrect information, she said. Auditors should remain attuned to events that could increase risks to data integrity and the impact they could have.

To that end, data flow diagrams are critical to data validation. Those in charge of the business area being audited may not always understand how data has moved from stage to stage. A data flow diagram that maps out the data's journey can help internal auditors understand and make sense of the data gathering process, Richards said. This can identify points where there were higher-risk manual inputs, for example, or where data might have been accidentally transformed into a different format, such as when a date comes up as a text string. It can also show the origin of different types of data and which systems and applications it has moved through, alerting the auditor to potential problems. Creating the diagram is only one part of the data validation process, but neglecting this step potentially means losing perspective on the best ways to validate a data set and assess the risk associated with certain fields. "You can't assume that data is correct just because it came from a system," said Richards.

In a time when the volume of data often seems overwhelming, data flow diagrams also offer a perspective on what data is most important or relevant to a particular audience. The diagram also helps pinpoint what information may be important to various stakeholders and whether the data answers their most important questions, Richards said.

Dashboards and other data visualization techniques can also help auditors pinpoint risk factors. "By displaying data points and combining the analytics with key performance indicators, auditors have the ability to drill down, looking both vertically and horizontally across risk areas to identify individual audits, scope, and key testing procedures."⁴

⁴ ["Data-enabled Internal Auditing,"](#) Muhammad Hassan Rizvi, Internal Auditor, February 21, 2022.



The Value of Storytelling

Turning data into action

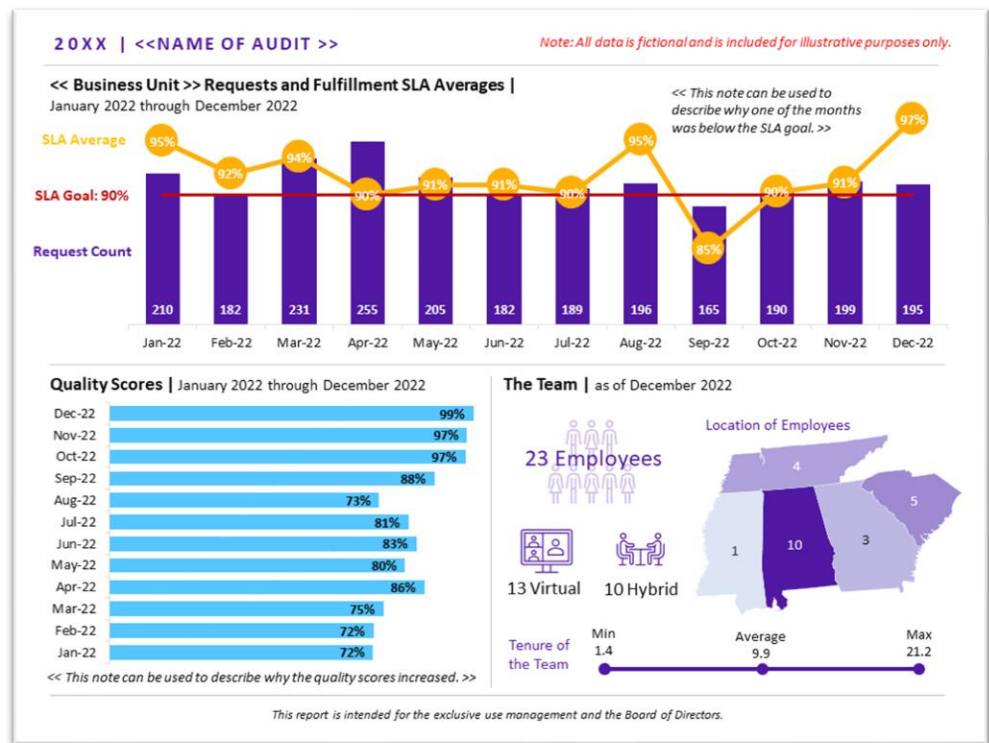
Data visualization

Data storytelling takes information and turns it into easily understandable graphics that present a clear narrative. These visualizations can offer an audience a new and easily understandable perspective. A business area that is focused on its own responsibilities may be surprised to learn the results of control testing, for example, or other considerations outside of its realm of expertise. In addition, because of internal audit's deep understanding of the organization and of the business area under audit, the auditors can create their own key performance indicators (KPIs) based on data sets that they have recognized as important. Internal audit's metrics or KPIs may integrate data of different types or from other sources within or outside the area, providing the business area's management with a fresh perspective. Internal audit can also use dashboards to assess risk at regular intervals or in real time. Foksinska Arnold's organization, for example, uses Power BI or Tableau to create visuals and dashboards that walk management through the data sets and bring them to life (Figure 3).

In creating their visualizations, auditors should tailor them to each audience, whether that means the business area being audited, senior management and the board, or other stakeholders. When developing visualizations, it is important to follow the rules of any

good story by including an introduction, a discussion of the setting, the different scenes that build the story, a climax, and a conclusion. "Don't jump to the punchlines," Richards advised, but tell a story that each specific audience can follow to gain a better level of understanding and a complete picture. Tell the story from beginning to end and attempt to simplify it as appropriate. The number of charts used should depend on the complexity of the information being conveyed.

Figure 3: KPI Presentation Example



Courtesy of Alicja Foksinska Arnold



For example, Foksinska Arnold's team presents a report to the group being audited at the end of every engagement. For this audience, the internal audit team offers a wide range of details because the group is seeking a full understanding of the health of their area. The internal audit report walks the group through every finding, how each one was identified, what testing was done, and the end results. Each detail-rich presentation requires an exit meeting of roughly an hour, she said.

This conversation is a learning experience for both the business area and internal audit, according to Foksinska Arnold. The business area is able to see the story of their department that internal audit has created and the unique approaches internal audit has used. "We're not there to tell them how to do their jobs, but to share our expertise," she said

When findings are problematic, visuals can clearly illustrate the issues and make them less difficult to present. They can demonstrate that the internal audit team's conclusions are not a judgment, but just the facts. Graphics can track the origins of the data behind a finding, the analysis involved, and the insights gained. They can also show how the internal auditors may have married different types of data — from within or outside the department audited — to develop their analyses and conclusions.

Internal auditors should keep in mind that data can also be used to illustrate a clean report. It can confirm what the audited group is doing right and enable it to identify best practices, she said.

The groups being audited appreciate the visualizations and the access to fresh research on their performance and risks. "They often call us back to do special advisory projects," Foksinska Arnold said. "When the information you offer is that transparent and you give them so much value, they see us in more of a partnership role."

Unlike a report to the audited business area, reports to the audit committee might last only five minutes. In this case, the focus of the presentation is a short but information-packed, three-page written report. It is written to be understood by directors and senior management who generally do not have extensive familiarity with each business area. While the auditee's information must cover numerous key points, Foksinska Arnold said, "Management doesn't want to read a 20-page report."

Her audit team's three-page report follows the story's narrative arc:

- **Page 1** covers background details, hitting the high points that the audit committee and management really need to know. Such points include issues such as which group is being audited, the purpose of the business area and the audit, the testing that was performed, and the risks in this area.
- **Page 2** uses visualizations to delve deeper into the situation in the department introduced on Page 1, using numerous separate visualizations. If the business area being audited is a call center, for example, charts can track the number of calls handled per month or average number of calls per employee per day to highlight daily details. Graphics can make data findings easier to understand and contextualize, showing how the data was identified and its impact. Graphics can also give an overview of all findings identified and offer the users further information on each one as needed.
- **Page 3** delivers the story's resolution, with the internal audit team's recommendations.

After internal audit has presented its findings, the business group comes back with a timeline for addressing any related problems. Internal audit can then schedule a follow up to make sure that issues have been addressed.

56%

Making the leap to more advanced analytics applications was the second greatest challenge for audit leaders at 56%, according to a Gartner survey. A total of 53% worried about IT auditing practices, and 44% also pointed to ineffective investment in audit analytics as a key concern.

- Gartner⁵

⁵ "Gartner Survey Reveals the Top Challenges for Internal Audit in 2022," Gartner, March 17, 2022, <https://www.gartner.com/en/newsroom/press-releases/2022-03-17-gartner-survey-reveals-the-top-challenges-for-internal-audit-in-2022>.



Conclusion

Internal auditors can bring a unique level of understanding and objectivity to each of the steps addressed in this brief. In the data gathering process, their focus on data integrity ensures the quality of information used for decision making. In validating data, they confirm its accuracy and completeness. And in their role as storytellers, they break down volumes of often complex data to present narratives that are most relevant and meaningful to each audience. By taking these steps, they confirm and clarify the value internal audit can add to data gathering, validation, and visualization.

The final installment in this series will examine developing a resilient data analytics strategy. An effective data analytics strategy enhances the internal audit function's capability and capacity, jibes with the organization's overall data strategy, and is critical to providing assurance on key areas of data protection, regulatory compliance, and overall effective data governance.



About The IIA

The Institute of Internal Auditors (IIA) is the internal audit profession's most widely recognized advocate, educator, and provider of standards, guidance, and certifications. Established in 1941, The IIA today serves more than 218,000 members from more than 170 countries and territories. The association's global headquarters is in Lake Mary, Fla., USA. For more information, visit theiia.org.

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