¶1520.16 *Using Data Analytics to Identify Compliance Risks*

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Introduction

Data analytics represents an ever-changing field of expertise that is integral to nearly all professions, including research administration. Everyone has their own perception of data analytics and what it means; it has become a buzzword to encompass a variety of topics and techniques. However, data analytics is formally defined as the collection, transformation, and organization of data in order to draw conclusions, make predictions, and drive informed decision-making.[1] This definition is broad and general, but it is an accurate reflection of the unique and varying ways that different organizations can apply data analytics. In particular, individuals who work in financial research administration can use data analytics to identify internal control gaps and non-compliant transactions. This includes analyzing grants for any previously unidentified risks or monitoring grants for potential risks that may emerge in the future.

Data analytics carries the stigma of being a complicated[2] and expensive[3] option for ensuring a compliant grants management program. This stigma can dissuade sponsored research programs that have limited time and funding to implement solutions they need immediately. However, data analytics does not need to be complicated or expensive; it only needs to be effective in answering a question or meeting a specific requirement. Sponsored program offices only need to know a few techniques with limited barriers to entry to be able to implement effective data analytics to assist in monitoring their program. Once the program offices have identified those techniques, research administrators can use them to implement a variety of analytics that are often only limited by the research administrators' imaginations.

Data analytics techniques and solutions are generally not intended to be a one-stop shop for monitoring. However, having an understanding of a variety of low-barrier techniques can limit the need for more expensive options. Each organization will have a different appetite for analytics and varying resources for formalized analytical solutions, such as specific commercial-off-the-shelf (COTS) tools. However, COTS products cannot always answer the question a sponsored research program is asking. The goal is not to identify a solution and implement it, but rather to identify a question the organization needs answered and find a solution that can answer that question. As such, there is not a one-size-fits-all approach to implementing data analytics.

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[1] Coursera. (2023 November 29). *What Is Data Analytics? Key Concepts, Skills, and Careers.* What Is Data Analytics? Key Concepts, Skills, and Careers | Coursera

[2] CIO.com. (2017 October 17). *Demystifying the dark science of data analytics.* Demystifying data analytics: How to create business value from data | CIO

[3] SurveyPoint.ai. (2023 December 18). *Demystifying Data Analysis Costs: Your 4-Step Guide to Painless Insights.* Demystifying Data Analysis Costs: Your 4-Step Guide to Painless Insights - Explore Remarkable Survey Point Knowledge for Free

Analytical Objectives and Needs

As noted above, the intent of analytics is to answer a question or provide better insight for an organization. In particular, the goal of grants management analytics is to answer questions about an organization's compliance, management, and oversight of its awards. As such, data analytic techniques in this area must be flexible, have quality data available for use as inputs, and address a gap in the organization's monitoring.

For data analytics to be flexible, the tools and techniques must be applicable to a variety of questions and solutions. Most organizations lack the luxury of buying impressive COTS products to answer a specific question. An organization should therefore seek out tools and solutions that have the potential to answer a variety of questions and provide a variety of solutions without significant costs or learning barriers.

Secondly, data analytics is only as good as the data it is analyzing. The phrase "bad data in, bad data out" is well known. If an organization does not have good data to analyze, it cannot expect analytics to produce good data for decision-making. If an organization needs to answer a specific question, it should begin by considering the availability and quality of the data needed to answer that question. For example, does the organization produce a report that contains the necessary fields? If not, can it create such a report? Does the organization collect the data needed in the first place and, if so, is that data complete and accurate? The better the quality of the available data, the greater the options for improved decision-making.

Lastly, data analytics can be overwhelming at times. Depending on the flexibility of an organization's analytics and the availability and quality of the data, the organization could have several analytic solutions, making it difficult to identify the areas to focus on. Organizations can drive effectiveness by focusing their data analytics on the questions identified, as well as on the organization's risks, gaps in internal controls, and known issues, rather than by trying to perform a review of the organization's overall grants management environment.

Although it is not possible to create a comprehensive, complete best practices guide to sponsored award data analytics—and this reference does not purport to be one—this reference can serve as an example of accessible and cost-effective techniques that organizations can apply to their grant management environment. It can also assist organizations in brainstorming techniques they can apply to other risky or control-deficient areas of their grant management environment.

Below, we discuss three examples of analytic techniques that organizations can use across a variety of data populations to answer specific questions. Each tool is fairly accessible and offers a wide breadth of training that limits potential implementation barriers and allows for flexibility in answering numerous financial oversight questions.

Analytical Techniques and Risks

In the following section, we use three separate data analytics tools to answer three separate analytical questions.

Microsoft Excel[4]

Most organizations are likely familiar with Microsoft Excel, as many organizations use it for a variety of purposes on a daily basis. However, Excel is also a powerful analytic tool that allows organizations to produce prompt and timely analytical results to address specific questions. Excel also has a particularly low barrier to entry, as most organizations have access to Excel through a Microsoft license model and there is no shortage of training available on a variety of Excel techniques and functionality.

As an example, organizations can use Excel to identify sponsored programs that have subrecipient activity but do not have approved budgets for subrecipient activity, which may indicate that the recipient issued an award to a subrecipient without the sponsor's approval. This analytic technique is not a foolproof indicator of grant mismanagement, as it is possible that the recipient may have obtained approval for a subaward after the sponsor approved the budget; however, it allows organizations to identify those awards that initially appear non-compliant for further investigation.

To perform this analytic, an organization generally only needs its subrecipient general ledger detail and the sponsored program budgets for each grant award. The organization can use Excel to create one pivot table[5] of its sponsored awards with subrecipient expense activity and another pivot table of its sponsored awards with budgeted subrecipients. Once the organization has pivoted the expense and budget activity, it can use VLOOKUP[6] to identify which sponsored awards have approved subrecipients in the award budgets.

Exhibit 1

	A	B	C
1	Budget Category	Subawards	
2			
3	Sum of Amount		
4	Grant Number	Total	Budget Data VLOOKUP
5	613760	14,315.35	-
6	653593	59,040.63	571,245.00
7	660330	63,743.79	-
8	669338	52,853.93	-
9	671985	569.74	-
10	675404	35,912.91	-
11	758852	33,683.09	225,000.00
12	787014	61,387.27	-
13	794154	(41,441.44)	-
14	866779	51,365.95	-
15	869538	22,271.33	-
16	893753	6,210.76	23,728.00

In Exhibit 1, we have identified each sponsored award that has subrecipient expense activity but does not have an approved subrecipient budget. These awards require additional review for sponsor approval. By eliminating awards that do not show signs of unexpected activity, this data analytic technique allows organizations to focus on those awards that present a greater level of risk.

[4] Corporate Finance Institute. *Excel Definition*. Excel Definition - What is Microsoft Excel? Overview, Definition (corporatefinanceinstitute.com)
[5] Microsoft Excel Support. *Inserting a Pivot Table*. Insert a PivotTable - Microsoft Support
[6] Microsoft Excel Support. *VLOOKUP Function*. VLOOKUP function - Microsoft Support

Microsoft Power BI[7]

Microsoft's Power BI may be less familiar to most organizations than Excel is; however, its use is increasing as a result of the rising number of requests for visualization and dashboards. Power BI is a visualization tool that transforms data into graphs, tables, dashboards, and other visualizations and enables organizations to track metrics. Power BI comes in two versions, Power BI Desktop and Power BI Pro. An organization can integrate either version into its Microsoft Enterprise license or may acquire them directly from the Microsoft website. Similar to Excel, a vast array of Power BI training is available to enable users to get up to speed quickly.

Organizations can use Power BI to track a variety of metrics and information in visual form by connecting a variety of data sources. For example, organizations can track the number of purchase orders they have, and the types of procurement processes used based on specific procurement threshold levels. All an organization would need to track this information is a data file of active purchase orders and the thresholds for certain types of procurements. Exhibit 2 below shows how the procurement thresholds combined with the purchase order database using a VLOOKUP.

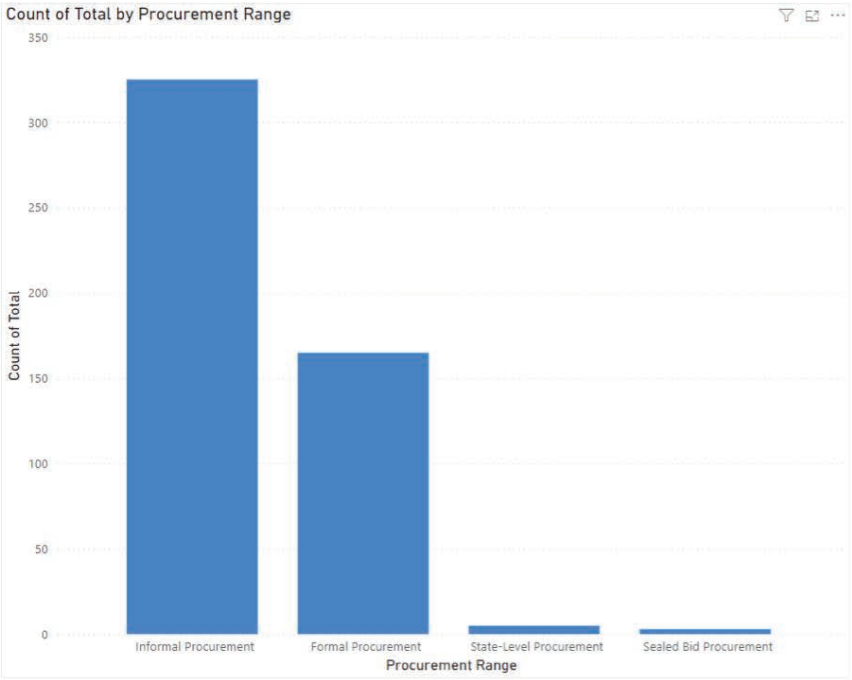
Exhibit 2

Service Line	Total	Procurement Range
TECH INC	91,243.45	Formal Procurement
COMBINED SVC CTR	84,712.00	Formal Procurement
Machine Shop	81,890.34	Formal Procurement
ASSOC UNIVERSIT	75,956.00	Formal Procurement
CHEM/RESEARCH STOCKROOM	68,826.80	Formal Procurement

Once the organization has prepared the database, it can produce a visual of the total procurements for each procurement range by directing Power BI to use a specific data file.[8] As shown in Exhibit 3 below, in this case, we have used Power BI to produce a bar graph[9] that contains the total counts for each standard procurement range. We have also included a narrative[10] specific to each threshold and the documentation and approvals needed for each procurement range as part of the visual.

[7] Learn Microsoft. *What is Power BI?* What is Power BI? - Power BI | Microsoft Learn
[8] Learn Microsoft. *Data sources for the Power BI service.* Data sources for the Power BI service - Power BI | Microsoft Learn
[9] Learn Microsoft. *Create and use basic area charts.* Basic area chart - Power BI | Microsoft Learn
[10] Learn Microsoft. *Create smart narrative summaries.* Create smart narrative summaries - Power BI | Microsoft Learn

Exhibit 3



Informal Procurement (Less than $10,000)
All services and goods may be acquired without competition, require a sole source justification form, and must have a purchase order processed through the procurement system.

Formal Procurement ($10,000 - $149,999.99)
The procurement must be publicly competed through the Procurement Department. It requires Procurement Department approval and Department Head Approval. If at least two bids aren't received, coordinate with the Procurement Department to identify if one bid is reasonably priced and document the sole source justification. All bids evaluations must be documented.

Sealed Bid Procurement ($150,000 - $249,999.99)
This is the same process as the Formal Procurement with the exception that all bids are sealed and independently reviewed by the Procurement Department ahead of presentation to the Department that requires the goods or services.

State-Level Procurement (Greater than $250,000)
This procurement requires President/CEO approval. Additionally, the Procurement Department will coordinate this specific procurement through the State to ensure the State receives the best value for the goods and services.

This type of visual can assist organizations in monitoring procurement standards and compliance with applicable regulations. It enables organizations to focus on specific, riskier procurements under the sponsored programs by drilling down to review specific purchase orders and follow up on whether the organization met the applicable standards for the procurement.

Once an organization has set up the dashboard visual, it does not need to constantly re-create the visual as new data becomes available; it can instead direct Power BI to utilize a specific file. When the user updates that file, they can save the new file in the same location as the prior file and refresh the dashboard to automatically update the visual. This allows for continuous and ongoing assessments of purchase orders under specific procurement thresholds.

Caseware IDEA[11]

Practitioners have traditionally used Caseware IDEA in the audit field; however, that makes it the perfect tool for organizations looking to limit the risk of any noncompliance that could appear in an audit report. Caseware IDEA is a data analytic tool that can aggregate millions of lines of data. It goes beyond the line limitations often encountered in Excel and is able to combine multiple data sources. Additionally, Caseware IDEA can automate specific functions for use on an ad-hoc basis.

One area of risk that organizations face is the possibility that recipients may charge unallowable expenses on awards. Although organizations may be very cognizant of the identified risks and monitor for them, expenses can often slip through

[11] Caseware. IDEA for External Audit. IDEA for External Audit | Caseware

the cracks. As such, organizations should implement a monitoring approach to identify risky transactions. As mentioned, Caseware IDEA can use scripted formulas to identify instances of unallowable expenses based on varying criteria and descriptions. Organizations can use an expense population and the Caseware IDEA tool to search for keywords that may represent risky or unallowable expenses, as shown in Exhibits 4 and 5.

Exhibit 4

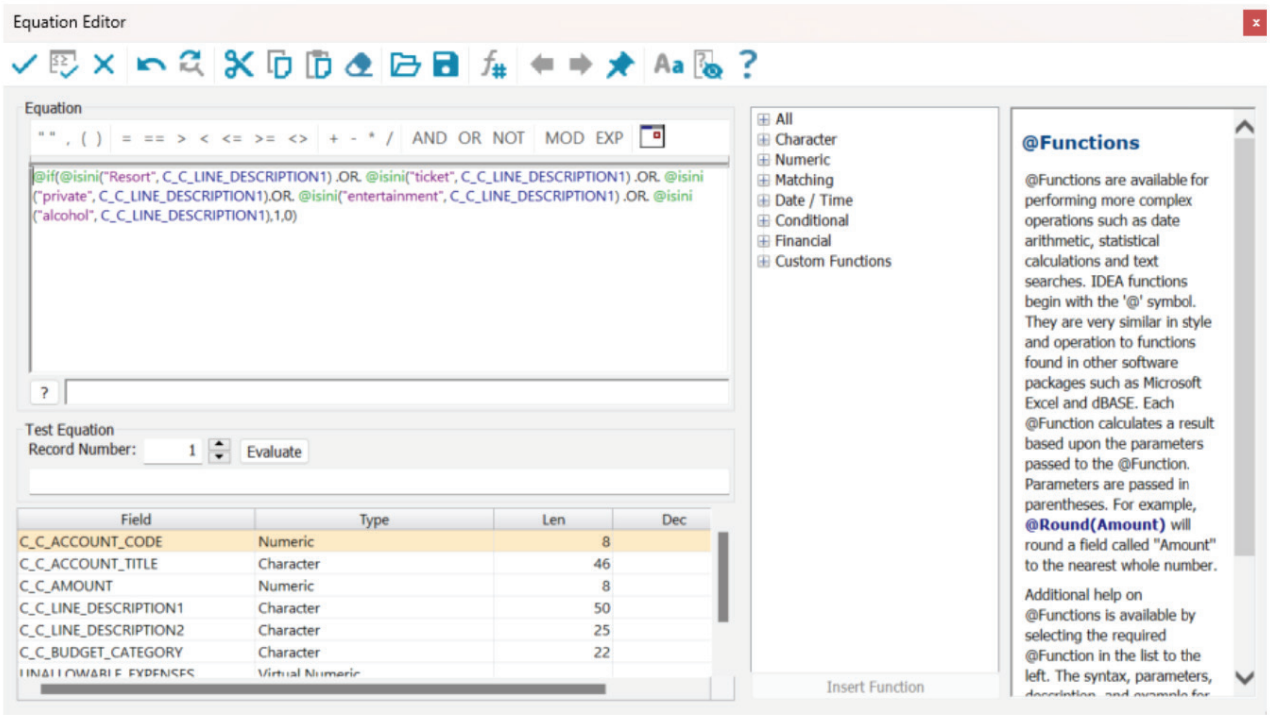
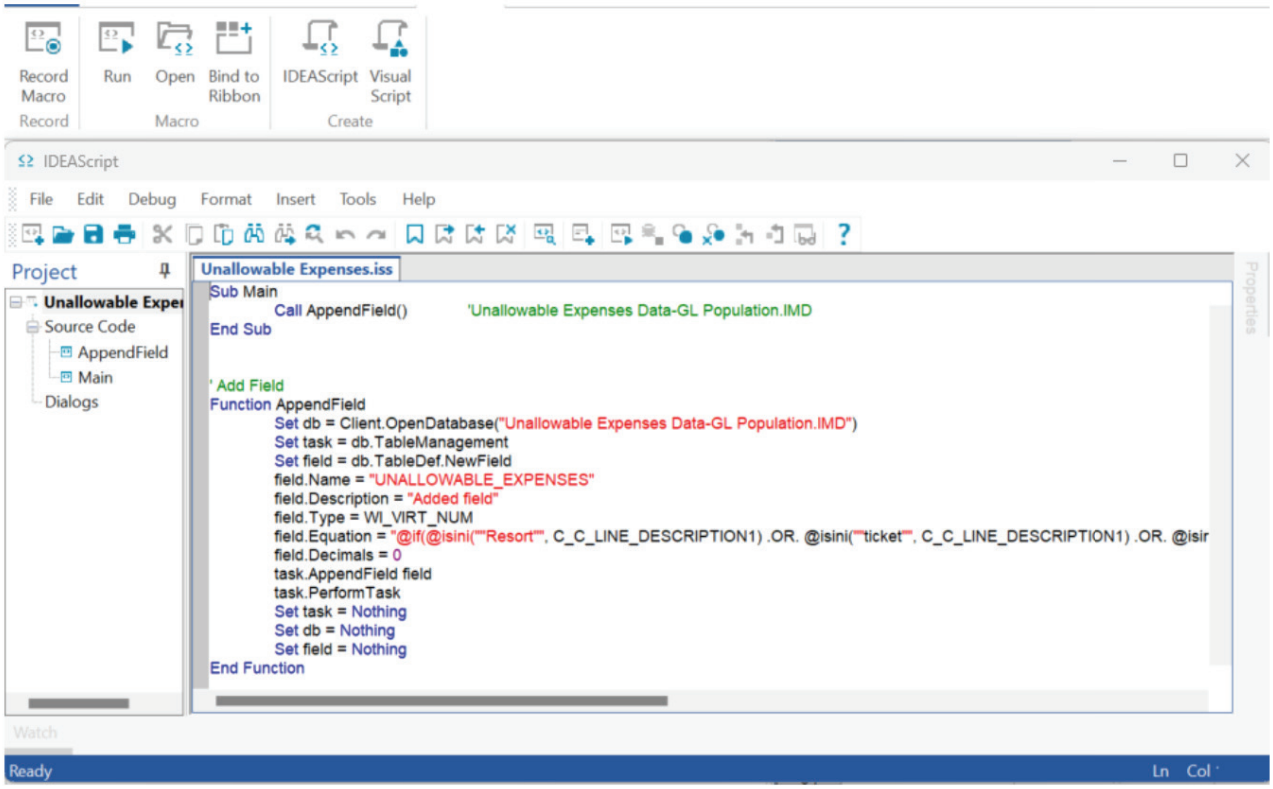


Exhibit 5

C_C_AMOUNT	C_C_LINE_DESCRIPTION1	C_C_BUDGET_CATEGORY
7,706.00	Gaming Computer Entertainment System	Computer Services
2,432.50	Bulls vs. Wizard Floor Seat Tickets	Consultant Services
22,972.92	Private Plane Rental	Equipment

Exhibit 4 shows the keywords for Caseware IDEA to search for in specific columns, while Exhibit 5 shows an example of expenses that Caseware IDEA identified based on the formula. These transactions represent areas of potential risk for the organization to investigate further. In addition to running this formula on an ad-hoc basis, the organization can automate the formula to run on a new population whenever necessary. Caseware IDEA uses a "Record Macro" functionality to build a script as the user creates a formula. The user can then save this script and use it at any time. Exhibit 6 shows the script resulting from the previous search.

Exhibit 6



Organizations can use a script such as this—or an adaptation of this script—to perform a variety of compliance oversight tasks. They can expand the script to focus on other risks or adjust it to focus on the risks most relevant to them.

Conclusion

Data analytics is a powerful tool that organizations can use in a variety of unique and creative ways to answer one or many of the questions that plague them. Data analytics must be as flexible and adaptable as its definition and interpretation. In turn, organizations must also be flexible and adaptable as technologies change over time. Each organization should consider those risks and questions that it needs to address with regard to its grant management environment, identify the data available to inform the decision-making process, then use data analytics to address risks and questions, where applicable. As organizations' grant management environments expand over time, they will have a greater need for expanded oversight and compliance monitoring, and data analytics can help them successfully meet that need.

Disclaimer: *Sikich does not sponsor nor is it sponsored or funded by Microsoft or Caseware. The tools represented in this article are only presented as examples of experience that our organization has in performing sponsored award oversight.*

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