Although generalized audit software (GAS) has been shown to significantly improve the efficiency and effectiveness of audits, many auditors do not use this technology. In fact, one auditor noted that, “Non-IT auditors seem overwhelmed and even intimidated by GAS tools.” The study described in this article employed an online survey of 277 auditors who use generalized audit software (GAS) to determine the factors that positively and negatively affect its usage.

The research on GAS has tended to overlook the influence of barriers that inhibit its usage and has merely focused on factors that enable its use. However, the factors that serve as barriers for rejection of systems are just as worthy of study as the factors that enable acceptance of systems. Research has shown that barriers to a system’s use, when present, tend to dissuade users; however, they do not, by their absence, encourage use. For example, just because a system is available and reliable does not mean that it is more likely to be used. On the other hand, if a system is not reliable or available, this could lead to outright rejection by users.

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Factors Affecting Generalized Audit Software Use

Figure 2 illustrates both barriers and enablers of GAS use for auditors. This model is not meant to be comprehensive, but it is a starting point for considering what affects GAS usage in an audit. The survey had multiple questions to measure each of the factors shown in Figure 2. Bold lines in the model indicate that the factor affects GAS use, whereas a dashed line indicates that the factor does not affect GAS use; the direction found in the study is indicated with a plus (+) sign, indicating it encourages use, or minus (-) sign, indicating it discourages use.

The survey included eight questions describing common uses of GAS in the audit (Figure 3, which ranks the uses from highest to lowest per audit role). Interestingly, across the financial, IT and operational audit roles, GAS is used mainly for sampling during an audit, followed by data mining. Conversely, the least used application of GAS across the three audit roles is regression analysis, followed by calculating ratios.

The study results revealed that two established factors in prior research encourage GAS usage: perceived ease of use and perceived usefulness.

Figure 4 reveals that, across audit roles, financial auditors perceive GAS as less easy to use than the other audit roles do. The means across audit roles for perceived usefulness (Figure 5) show that, overall, operational auditors perceive GAS as the most useful.

When discussing GAS, perceived ease of use has been shown to have a positive influence on the use...
The survey obtained open-ended responses as to why others might “feel differently” about these two factors. One financial auditor stated, “Many think GAS is difficult to use. Also, many don’t realize how much the software can do. Most of this has to do with lack of training.” Additionally, an IT auditor noted, “Financial and operational auditors tend to
think the time required to use GAS does not justify any benefits.” Another financial auditor held the opinion that “[GAS] is seen as too expensive and too time consuming to train all of the staff. The decision is short sighted.” One operational auditor shared that “IT auditors generally have other tools that can do the same data manipulation.” Another operational auditor stated, “IT auditors are used to having query options using Structured Query Language (SQL), so [they] may not find generalized auditing software helpful.”

System problems are also shown to be a significant barrier to GAS use. In past research, slow system response times have been one such barrier because they indicate to the user that something is wrong and they threaten the user’s perception of the system as a whole.23

Regarding the use of GAS, some issues that signal system problems include difficulty extracting data, lack of system documentation and failure of the GAS to work as promised.

As stated earlier, barriers may well discourage GAS usage when they are present, but they do not necessarily encourage usage when they are absent. Having difficulty extracting data would likely affect GAS usage negatively. Ease of data extraction, on the other hand, would not automatically increase system usage because users expect that of a system. Based on the means for all of the audit roles (especially financial) shown in figure 6, it appears that data extraction problems represent the most salient barrier to GAS usage. Additionally, IT auditors perceive that documentation provided by vendors is not sufficient, likely because they are using GAS for more advanced purposes. However, overall, IT auditors perceive fewer problems with using GAS. According to one respondent, “IT auditors seem to be more comfortable using it than the other two groups. They evidently understand how to use it better than the other two groups or grasp the concepts and retain them better.”

Respondents cited perceived system problems with GAS. Among them, an IT auditor stated, “Those who have not previously used generalized audit software and rely on spreadsheet or database software tend not to trust GAS, think that GAS is too hard to learn and think that it will impact audit time frames.” Another IT auditor mentioned that “financial auditors have the perception that using GAS requires technical skills and, hence, it is only useful to IT auditors. However, GAS could be used by all types of auditors once they understand the functionality and what can be done using them.” A financial auditor stated that while some auditors use the software willingly and as intended, “outliers will see it as too complicated to use sufficiently.”
not previously used generalized audit software and rely on spreadsheet or database software tend to not trust generalized audit software, as their spreadsheet/database formulas are ‘tried and true’ (even if the formulas are inaccurate).”

These results point to a need for management to incorporate education, training and communication when adopting GAS. As part of a change management strategy, education is a key part of adopting any new technology. It can demonstrate the “why” of the technology’s utility.

After education comes training, which serves as the “how” in adopting the technology. Training may also serve as a response to negative feelings regarding the technology. Finally, management must communicate support for GAS usage to reduce negative perceptions toward the software. Communication should relay essential information on why GAS can be useful in the audit. However, communication should be a two-way street. Employees should be solicited for feedback on their concerns about the technology and should feel comfortable asking questions and expressing their concerns about its use.

The idea of perceived threat was reinforced in a study concluding, “When a system is introduced, users will first assess it in terms of the interplay between its features and their abilities or needs. They will then make projections about the consequences of its use. If anticipated conditions are threatening (for instance, a change to how they perform their job), resistance behaviors will result.”

The means across audit roles for perceived threat in figure 7 are low compared to the other factors in the model, which suggests that, although it is significant, auditors do not think GAS use interferes with their ability to perform their duties as much. IT auditors have the lowest sense of threat from using GAS.

One operational auditor surveyed noted that older, non-IT-savvy professionals tend to feel more threatened by new software tools, saying, “I think it depends on what generation they are from.” Another respondent made this point: “If an auditor is not comfortable with the analytical thinking required to successfully apply generalized audit software, they’ll tend to want to apply methods where they are in total control and the generalized audit software isn’t computing ‘behind the scenes’.” An IT auditor noted, “Those who have not previously used generalized audit software and rely on spreadsheet or database software tend to not trust generalized audit software, as their spreadsheet/database formulas are ‘tried and true’ (even if the formulas are inaccurate).”

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Splitting the data also showed that system problems are more salient for external auditors than for internal auditors. According to one respondent, “I think [external] financial auditors are hesitant to adopt something new, primarily because the Big 4 accounting firms are so focused on doing things the same way over and over and not adapting.”

**Discussion and Conclusion**

According to the study’s results, negative factors affect GAS usage and bias enablers. In looking at figure 1, it can be seen that both barriers (system problems and perceived threat) affect enablers of ease of use and usefulness and also usage directly (exceptions are shown with dotted lines). Determining perceived threat to be significant reaffirms the findings of the study, indicating that auditors may be resistant to GAS usage because they believe that it threatens the way they are accustomed to conducting audits and that it threatens the use of tools they are already comfortable with and trust. Overcoming these negative barriers may, therefore, be necessary if positive factors are going to substantially affect GAS usage.

Other findings show that:

- Factors that inhibit usage continue to be significant even post-adoption.
- Organizations should invest in training and other change management practices that mediate all types of barriers to using GAS.
- Barriers to GAS use are affected by the role of the auditor—that is, internal vs. external auditor.

GAS usage among auditors remains low. This study may be of use to software vendors and auditing firms in promoting the usage of GAS among all types of auditors. Software trainers should understand the relevance of perceived threat, especially concerning loss of job control, and emphasize that GAS adds to, rather than replaces, auditors’ functions and duties. Organizations should supplement technical training (with an emphasis on GAS usage) with training on the use of GAS and its impact on their role and responsibilities.
on extraction of data for analysis) with appropriate change management practices to decrease resistance to change. Sponsorship, coaching, communication and training are all important if GAS is to be integrated into the audit. Also, proactive resistance management is part of any change management program. This entails identifying the source of resistance early on and how objections for using GAS can be answered before they manifest themselves and become engrained in the culture of the organization. IT auditors in the survey sample, whether internal or external, were seen as being more confident with GAS, and one stated, “IT auditors are more apt to utilize generalized audit software as it was fully intended.”

“Because internal and external auditors have different responsibilities, they may perceive the relevance and importance of GAS differently.”

On a positive note, survey respondents appear to believe that GAS is useful and easy to use. Trainers can use these results as evidence of the positive aspects of using GAS, especially when emphasizing that GAS enhances, rather than substitutes, auditor functions.

Endnotes

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