

How Robotic Process Is Transforming

IN BRIEF

Technology continues to change society at a rapid pace, and accounting and auditing are by no means immune. New technologies are increasingly able to mimic human activity, taking on repetitive tasks more quickly and accurately than people can. The authors provide an overview of the ways in which robotic process automation may change how the profession operates, with a particular focus on the area of revenue audits.

Auditing has historically incorporated many computer-dependent tools and processes, which were often interlinked by many manual steps and keystrokes. A new set of overlay software has emerged, however, that combines these disparate actions into a single smooth automated process. Robotic process automation (RPA) uses these new software tools, such as those offered by Blue Prism or UiPath, to transform a still somewhat handmade audit process into a more assembly-line audit process. RPA represents a dramatic and disruptive change in current audit practice that promises to allow auditors to operate at a much higher level. Leslie Willcocks, a professor at the London School of Economics, has defined RPA as “a type of software that mimics the activity of a human being in carrying out a task within a process. It can do repetitive stuff more quickly, accurately, and tirelessly than humans, freeing them to do other tasks” (Xavier Luher, “The Next Acronym You Need to Know About: RPA (Robotic Process Automation),” McKinsey & Company, December 2016, <https://mck.co/2LmMmUF>). RPA can help automate repetitive tasks, such as the copying and pasting of information. For accountants, RPA represents the opportunity to improve audit quality; indeed, RPA is already demonstrating its ability to improve business processes and services offered by public accounting firms (“A Holistic Approach to Insurance Automation,” Accenture white paper, 2016, <https://accntu.re/2GLBkEQ>; “Robotic Process Automation (RPA): A Primer for Internal Audit Professionals,” PricewaterhouseCoopers, October 2017, <https://pwc.to/2KTBnB8>). Although some fear that RPA heralds the replacement of people with robots, it is better understood as changing the role of human workers, freeing their time up for more meaningful work.

RPA in Public Accounting Practice

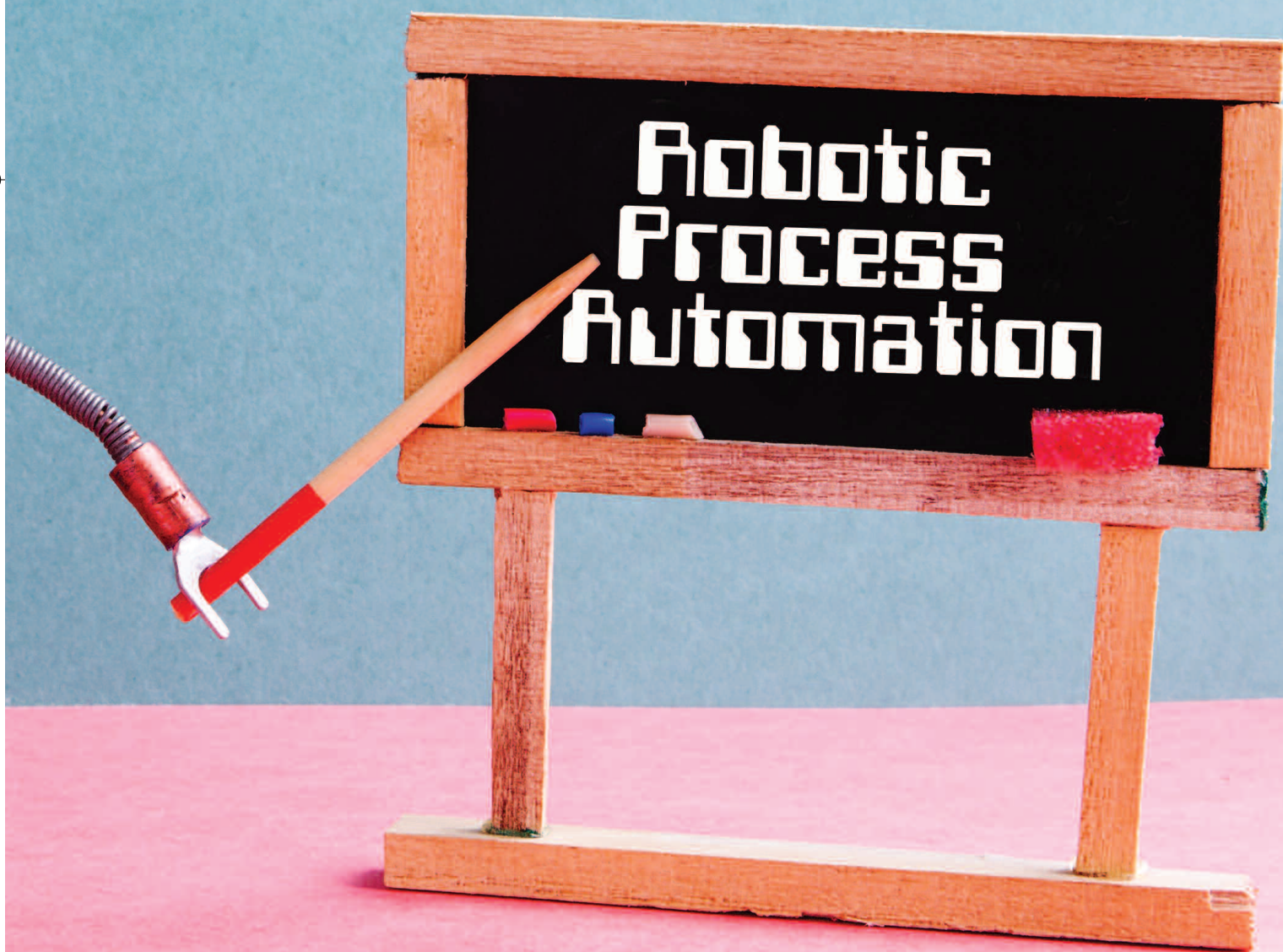
RPA has already garnered interest from public accounting firms, particularly with respect to taxation, advisory, and assurance services. For example,





Automation Accounting and Auditing

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a significant portion of tax activities, such as the calculation of book-tax differences and the preparation of tax returns, has been successfully automated by RPA software robots (D. A. Wood, L.A. Cooper, D.K. Holderness, and T. Sorensen, "Robotic Process Automation in Public Accounting," working paper, 2018). RPA is also offered to clients as an advisory product and service. While RPA software has been widely implemented for tax and advisory activities, RPA for auditing services remains in its early stages due to the highly regulated nature of audit

control tests and tests of details). Revenue is generally a high-risk area in audit engagements, and automating the tasks that do not require auditor judgment has the potential to improve audit quality by reallocating the work of auditors to analyzing the differences generated by the RPA software.

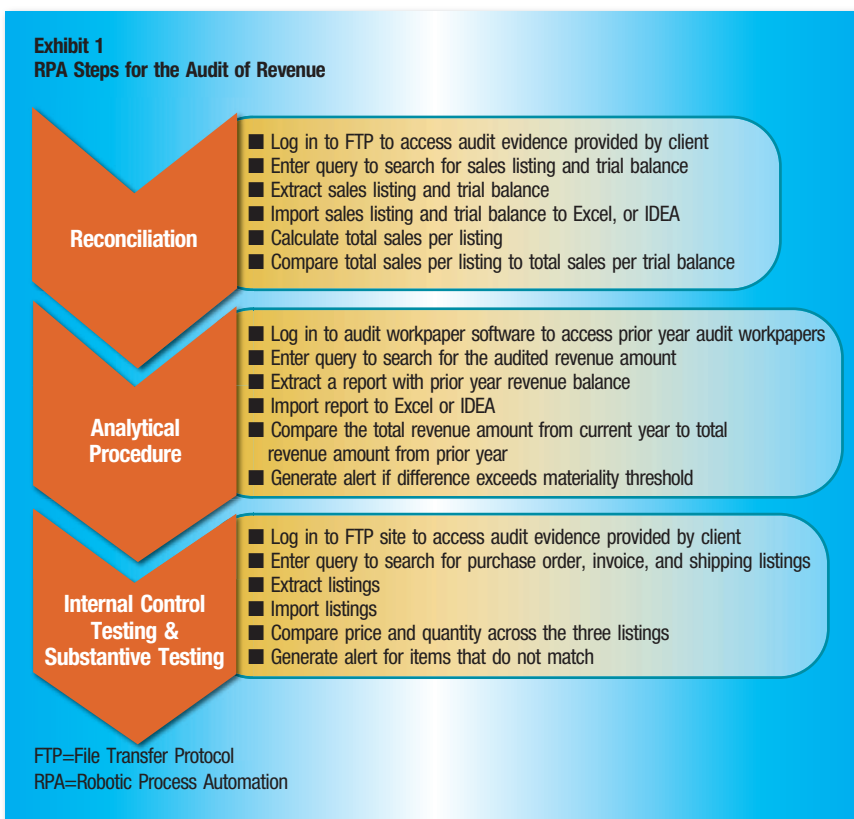
RPA for Reconciliation and Analytical Procedures

In the audit of revenue, RPA can assist auditors by logging into a client's secure file transfer protocol (FTP) site to retrieve related audit evidence,

generate an alert if the difference exceeds the materiality threshold.

RPA for Dual-Purpose Audit Tests

RPA can be programmed to calculate whether the price and quantity are different across sales invoices, sales orders, and shipping documents, and to generate alerts for sales transactions that contain differences in price and quantity. By automating these procedures, auditors can reallocate their time to more value-added activities, which will inherently increase audit quality. By leveraging RPA software, auditors can obtain a better understanding of the client's business operations and therefore be able to more precisely assess the risk of material misstatement.



services for public companies (Wood et al. 2018). Nevertheless, it is important to discuss RPA applications to audit services. As shown in *Exhibit 1*, revenue audits can be automated by software robots that perform rules-based functions to execute reconciliations, analytical procedures, and dual-purpose procedures (e.g., internal

including the listings for current and prior year sales and the trial balance. RPA can then calculate the total sales per the listing and compare it to the total per the trial balance. Assuming the amounts reconcile, RPA can subsequently calculate whether the total revenue amount from the current and prior year listings is materially different, and

Three-Step Approach to RPA-Based Audits

RPA is a form of process improvement using technology; when applied to auditing, RPA is expected to not only replace manual and mundane audit tasks, but also to motivate the re-engineering of audit processes. When deciding whether RPA is a good fit, public accounting firms can refer to the RPA implementation roadmap suggested by K. Moffit, A.M. Rozario, and M.A. Vasarhelyi ("Robotic Process Automation for Auditing," *Journal of Emerging Technologies in Accounting*, forthcoming). According to the roadmap, RPA implementation consists of three main stages: 1) process understanding, 2) audit data standardization (ADS), and 3) execution of automated audit tests (i.e., audit apps).

Process understanding. Theoretically, a large number of audit processes may be a good fit for RPA. The audit processes that would benefit the most from RPA are those that contain defined audit tasks that are repetitive and time consuming and that do not require audit judgment. Public accounting firms may identify an audit process where RPA can add value by considering expert knowl-

edge, such as that of revenue audit leaders, and calculating the actual hours spent performing audit tasks. Furthermore, the most important factor to justify automation is the number of times a firm needs to perform a particular function, which is mainly dependent on the number of similar audits being done.

Once a firm determines that a process is a good candidate for RPA implementation, the next step in understanding the process is to divide audit tasks into small audit modules that can be interpreted by software programs. For example, the task of importing or exporting data is intuitive to a human user, but for a software program, the task would have to be divided into a series of small steps:

- Defining the directory from which the file is to be imported
- Importing the file
- Saving the imported file
- Defining the directory into which to export the saved file.

Audit data standardization (ADS). To run as intended, RPA audit applications need consistency across data fields. Audit-related data may come from different sources, such as the client's ERP systems or third-party asset managers; thus, data field names in different audit-related reports that contain the same information may be different. If so, RPA software will not be able to execute the intended audit test. Consequently, the second stage in RPA implementation is for public accounting firms to create an audit data standard for each process that will be replaced by RPA.

ADS is becoming more relevant as public accounting firms consider the use of technology in financial statement audits. An ADS template incorporates the audit-related data that is necessary to execute audit tests. Similar data field names and formats can be designed by the firm to ensure the RPA audit application achieves its intended objectives.

Execution of RPA-based audit tests. The final step in the RPA audit implemen-

tation framework is to program the software to automatically execute audit tests and deploy it on real-world audit engagements. There are numerous RPA software tools that public accounting firms can leverage; BluePrism (<https://www.blueprism.com/>) and UiPath (<https://www.uipath.com/>) are among the most well-known tools on the market. The advantage of adopting ready-to-use RPA software tools is that they require little to no additional programming. Nevertheless, programming languages such as Python and R can assist in the deployment of RPA-based audit tasks, though they require additional programming skills. Python and R, however, already have libraries that are very useful for RPA functions.

rent (manual) audit tests and RPA-based audit tests should also be performed as a way to validate RPA audit tools. Moreover, for RPA to thrive in audit engagements, firms should leverage the support of their IT departments. Establishing an RPA support hotline can help auditors gain more confidence with these tools, and ongoing communication between the audit engagement team and IT support can also help ensure that RPA audit tools are fine-tuned to meet specified audit objectives.

What's Next?

The excitement around RPA is well founded, and the accounting profession is readily embracing this technol-

When applied to auditing, RPA is expected to not only replace manual and mundane audit tasks, but also to motivate the re-engineering of audit processes.

Programming audit tests as rules-based functions would enable the automatic execution of audit tests. Once audit tests are programmed, an auditor can simply click a button for the RPA-based audit tests to import and read data, perform rules-based audit tests, and export the results of audit tests into an audit workpaper.

While RPA has the potential to automate most parts of audit processes, it is preferable for public accounting firms to start small. Targeting low-risk process areas that do not require audit judgment should improve the success rates of RPA projects at firms. Starting small can also increase confidence among RPA software users.

The deployment of RPA audit tests on audit engagements is critical in measuring the success of RPA-based audits. Parallel audit testing consisting of cur-

rent RPA-based audit procedures have the potential to improve audit efficiency and effectiveness. More so than ever, change in the audit profession is slowly but steadily happening, and professionals should be ready to embrace RPA technology and enjoy the fruits of its labor. □

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