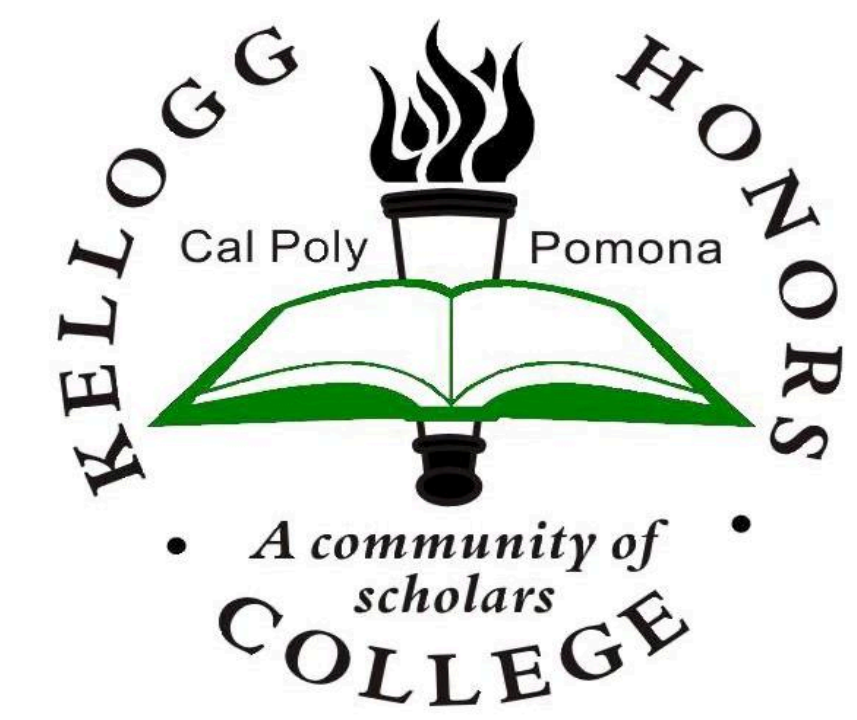# The Emergence of Robotic Process Automation in Auditing

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Abstract

In an effort to stay up to date in this new age of digital transformation, the accounting industry has sought out new technologies that are geared towards improving the efficiency and effectiveness of their services. One developing technology that has accrued much attention in the tax and advisory sectors of public accounting and is currently progressing into the assurance sector is Robotic Process Automation (RPA). Firms who are currently utilizing RPA have benefitted from saved costs and increased operational efficiency in their tax and advisory services. However, what public accounting firms and current research studies are more interested in is investigating the possible impact RPA will have on the assurance sector since RPA is expected to go beyond automating the manual and repetitive audit tasks and begin to restructure the auditor's role and re-engineer the entire audit process. The focus of this research study is to gain an increased understanding of RPA and its lasting effects on business practices, specifically in audit, through a collection of contemporary research studies.

What is RPA?

According to the Institute of Electrical and Electronics Engineers Standards Association, a leading consensus building organization that nurtures, develops and advances global technologies, RPA can be defined as "a preconfigured software instance that uses business rules and predefined activity choreography to complete the autonomous execution of a combination of processes, activities, transactions, and tasks in one or more unrelated software systems to deliver a result or service with human exception management" (Motiff et al., 2018). The preconfigured software instances are often called software robots. Therefore, in short, through a user interface the RPA robots automate and execute human processes, activities, and transactions in one or more unrelated software systems.

RPA Criteria

There are three fundamental criteria that must be met for the process or task to be selected for automation. The processes must be:

1. Well-Defined

2. Highly Repetitive

3. Mature

A Framework For Implementing RPA

In order to ensure a smooth transition, public accounting firms need to develop a plan of action. Huang (2019) developed a four-stage framework in applying RPA in auditing and then demonstrated its feasibility by applying that framework to a pilot project. The four stage framework is divided up as (e.g. see fig. 1): 1) procedure selection, 2) procedure modification, 3) implementation, and 4) evaluation and operation. The first stage of the proposed framework urges accounting firms to review the structure of its audit procedures and identify appropriate candidates based on three factors: whether the audit procedure meets the three fundamental RPA criteria discussed earlier, whether the data contained in the audit procedure is compatible with RPA software, and whether to use RPA in a given audit procedure based on the complexity of the procedure. The second stage lays out a three-step process to help auditors modify the current audit program to match the RPA software, extend the scale of "RPA-based" audits, and check and confirm the data standardization. The third stage is implementation. The framework recommends building a program in-house rather than purchasing licenses from RPA providers for the following three reasons: 1) RPA comes with user-

Figure 1 The 4 stage framework for implementing RPA (Huang et al., 2019)

friendly interface, which simplifies the coding process and allows auditors to easily learn how to build an RPA program; 2) to successfully program RPA to perform the designed tasks and reduce implementation risk, auditors' need to have an understanding of the underlying details of each audit procedure; and 3) the accounting firm has more control and confidential information can be better protected with in-house implementation. The last stage is to evaluate and perform the RPA-based audit procedure to evaluate: 1) the effectiveness by independently performing the audit procedure by the RPA program and by the audit team to compare the outcomes, 2) the effect of RPA-based procedures on the detection risk and confirm the audit risk is not increased, and 3) the accuracy and efficiency by managing and monitoring the operation of the RPA program (Huang et al., 2019).
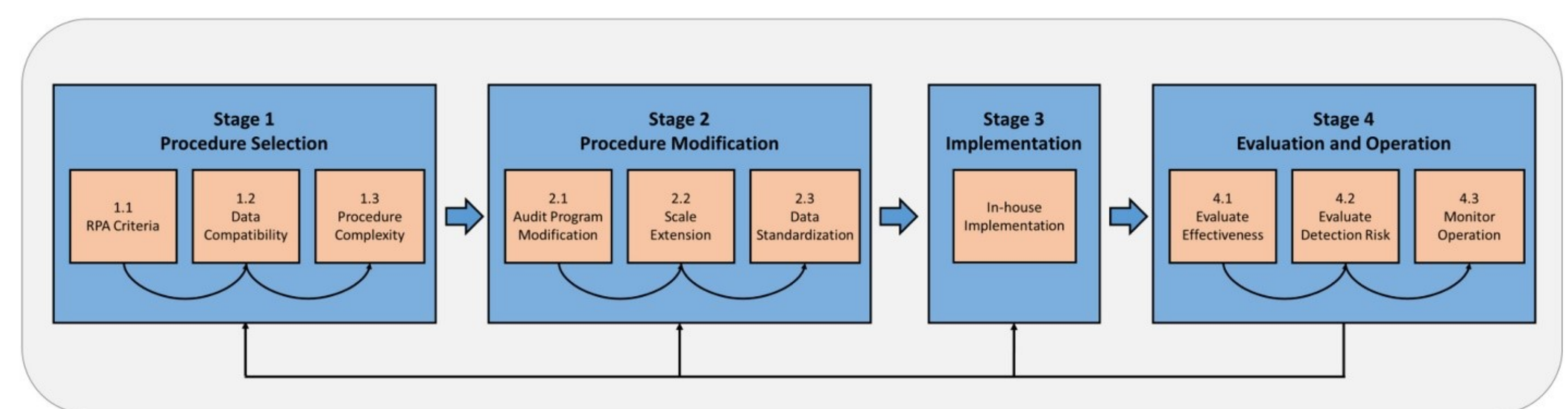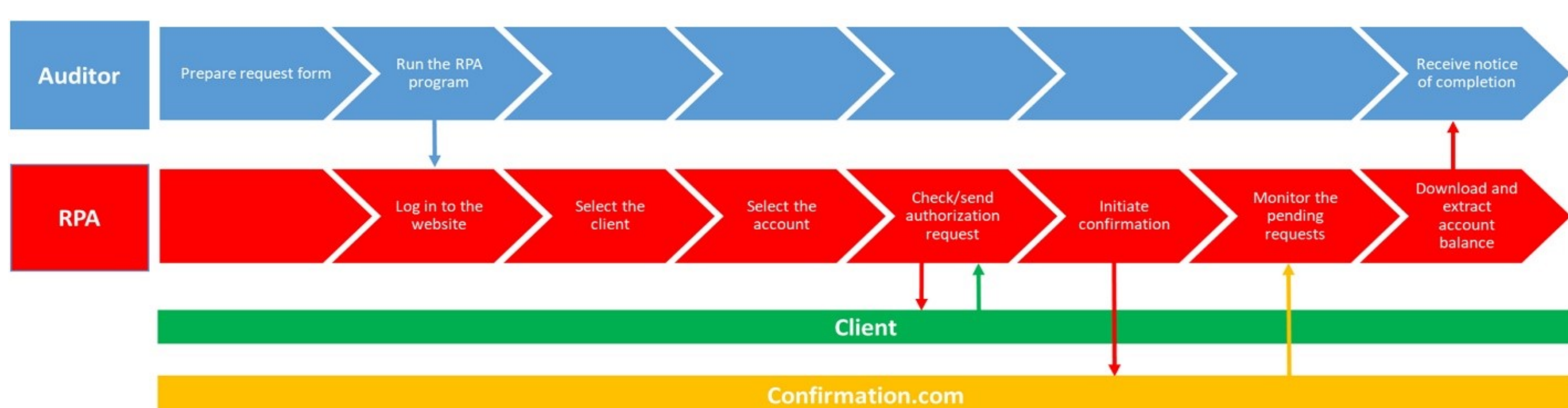

Figure 2 The flow of the proposed RPA-based confirmation process (Huang et al., 2019)

To confirm the effectiveness of the framework, Huang (2019) worked with a CPA firm and implemented a pilot RPA program to automate one of their audit tasks, the confirmation process. After diligently going through stages 1-3, the RPA pilot project was evaluated on its performance, its effect on detection and audit risk, and its operation through monitoring (e.g. *see fig. 2*). The results showed that information collected from the RPA program matched that from the manual process, supporting the effectiveness of the programs performance. The pilot project results also demonstrated that the RPA-based confirmation procedure would not increase or add any detection risk or audit risk comparatively to the current audit procedure. Finally, the pilot RPA reduced the number of working hours spent by the auditor and saved cost. In the end, it was concluded that results of the pilot RPA project were able to demonstrate the feasibility of RPA software in the audit industry (Huang et al., 2019).

Benefits of RPA

- Reduced working hours
- Cost reduction
- Decreased cycle times
- Improved throughput and accuracy
- Expanded flexibility
- Increased scalability
- Restructure of audit procedures
- Boost in employee morale

Concerns of RPA

What are the effects of RPA on audit risk?
– Previous pilot RPA programs have demonstrated that RPA-based procedures would not add any detection risk or increase the audit risk comparatively to the way current audit procedures are performed (Huang et al., 2019).

How does RPA affect current and future employment for accounts?
– Reviews of case studies of firms that have already deployed RPA suggest that the goal for almost all these firms is to increase efficiency and effectiveness of their workforce rather than eliminating it (Deloitte, 2017).

Future of RPA

Big 4 RPA leaders believe the current RPA is a steppingstone to a future RPA that will "become smarter" and capable of executing procedures, not limited by rule-based instructions (Cooper et al., 2019). Areas that should be further researched include:
– How to address the challenges of RPA implementation
– How to apply RPA audit tests to different phases of an engagement
– The criteria that should be used to evaluate RPA performance
– Testing the reliability of data collected by an RPA program
– The threat of cybersecurity failures
– Allocation of RPA costs
– The effect of RPA on old processes and current audit standards (Motiff et al., 2018).

Conclusion

With already much garnered interest from public accounting firms, specifically in the tax and advisory departments, RPA is an emerging automation technology that is now in the stages of taking root in the auditing practice as well. When applied to auditing, the expectation is that RPA will go beyond automating a few manual repetitive audit tasks and begin to motivate the re-engineering of the audit process entirely (Rozario et al., 2019). The role of the auditor would be repurposed from being a data collector, processor and disseminator to a role more focused on the evaluation component of audit procedures that require creative thinking and professional judgment (Motiff et al., 2018). The purpose of this research study was to help accounting professionals and other related parties understand RPA in order to facilitate its adoption and application in the audit industry. Although there is still limited research on the use of RPA in auditing, PCAOB and other governmental regulators still have many concerns of the effect this technology will have on the reliability and quality of the audit engagements. Continuing the discussion of the adoption of this technology in the auditing practice and what that entails, and investigating the actual application of RPA in audit pilot projects will hopefully build all related parties' confidence in the full adoption of this technological innovation within the assurance sector of public accounting.

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