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Robotic Process Automation (RPA): Its Application and the Place for Accountants in the 21st Century

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ABSTRACT

This article explored the Application of Robotic Process Automation (RPA) in 21st Century and the place of accountants. RPA is common among firms and accountants looking to increase efficiency in financial reporting. RPA is a concern for economists and scholars as they opine that RPA will render many accountants jobless. This article discusses how the adoption of RPA by firms will not be a cause for job loss among accountants, but rather it will launch accountants to a higher career function. Robots can only process data and offer narrow interpretations, but a wider interpretation of processed financial and data making decisions based on analyses will require human judgement.

Keywords: *Robotic Process Automation; Job Loss Among Accountants; Adoption of RPA; Efficiency in Financial Reporting*

1. Introduction

For good reason, much work has been done lately on Robotic Process Automation (RPA). RPA promises increased efficiency in accounting and finance firms. This, RPA will achieve by enhancing the wider integration of incongruent financial systems and applications.

Contrary to the popular view that robotic technology could substitute accountants, some authors (McCallion & McMullan, 2015; Chiew & Yeong, 2017; Gray, 2018; TechWire, 2019) opine that the adoption of RPA by firms will complexify the duties of accountants, eliminating only accountants and accounting firms who hold tight the traditional method of accounting. They posit that instead of the RPA replacing accountants, this new technology will transform the duties of accountants. Auerswald (2012) asserts that historically, whenever machines or tools substitute human capability, new capabilities, and human experiences emerge. This is traceable to the evolution of man – transcending from hunter-gatherer to farmer, farmer to more industrialized types of work. Similarly, the accounting profession is expanding its boundaries, and the needed skills for it are evolving. Technological advancement has released accountants from the stress of mundane and menial tasks as manual data entry, to pursue higher-value work that may bring in higher incomes. This opens accountants up to harness technologies like data analytics tools to exhibit more timely and in-depth financial expertise in helping their business outfits navigate the dynamic business landscape of the 21st Century.

RPA collects, manipulates, and interprets financial data that flows from myriad Information Technology applications and systems, efficiently taking over these monotonous tasks from accountants. This frees up the accounting staff to

become strategic accountants. The use of Robots to handle routing tasks handled by accountants has in a way have liberated accountants to a higher purpose in the financial industry – the interpretation of financial data to improve business decisions.

RPA is just the latest iteration in a long progression of Finance and Accounting software tools designed to improve efficiency and data accuracy. RPA extends the automated functionality of ERP (Enterprise Resource Planning) systems beyond the range of application programming interfaces (commonly known as APIs) and simple object access protocol, which are used to integrate the ERP system with other IT applications. Instead of the customary weeks, it takes to link these systems, RPA pares the time down to a matter of days.

Research into RPA is growing, likewise its adoption. This research work was conducted to offer clarification to the problem RPA adoption could pose for accountants.

2. General uses of Robotic Process Accounting

RPA (Robotic Process Automation) is used to automate the workflow, infrastructure, and labor-intensive back-office processes.

The software bots (automated programs) can interact with the in-house application, website, user portal, etc. RPA is a software program that runs on the end-user PC, laptop, or mobile device.

RPA automates the HR tasks, including onboarding and offboarding, updating employee information, and the submission process of timesheets.

Robotic Process Automation can be used for obtaining, automating order processes and payments, monitoring inventory levels, and tracking shipments.

Following are the general use of RPA that is given below:

1. Automating the Report
2. Reducing the Gap between Systems
3. Quality Assurance
4. Cross-Checking the Information
5. Migration of Data
6. Forecast Revenue
7. Virtual System Integration

3. Industry purpose RPA Usage

The RPA is used in different types of industries for several purposes. RPA is used in telecommunication industries for monitoring the CRM subscriber's feeds, fraud management data, and customer data updates.

It is a form of digital machine labor that replicates human cognitive functions and performs the task accurately and efficiently in various industries.

RPA (Robotic Process Automation) uses software with artificial intelligence and machine learning skills to handle the tasks that previously needed human interaction. Many industries are using RPA to produce better results in their business processes. Following are some industry fields that use RPA, are given below:

1. HealthCare
2. HR (Human Resources)
3. Telecommunications
4. Insurance
5. Retail Industries
6. Travel and Logistics
7. Accounting Firms

8. Etc.

RPA is also used by the manufacturing industry. These types of industries used physical robots to accumulate the test. Manufacturing companies are optimizing complex back-office operations such as vendor communications, inventory management, procurement, payment processing, and report generation.

4. Comparison Between Test Automation and RPA

There exist multiple overlaps between the test automation tool and the RPA tool. The RPA is not a testing tool, but it could be utilized as a testing tool in the future. The functionalities and different kinds of business processes are automated with the help of RPA (Robotic Process Automation) software.

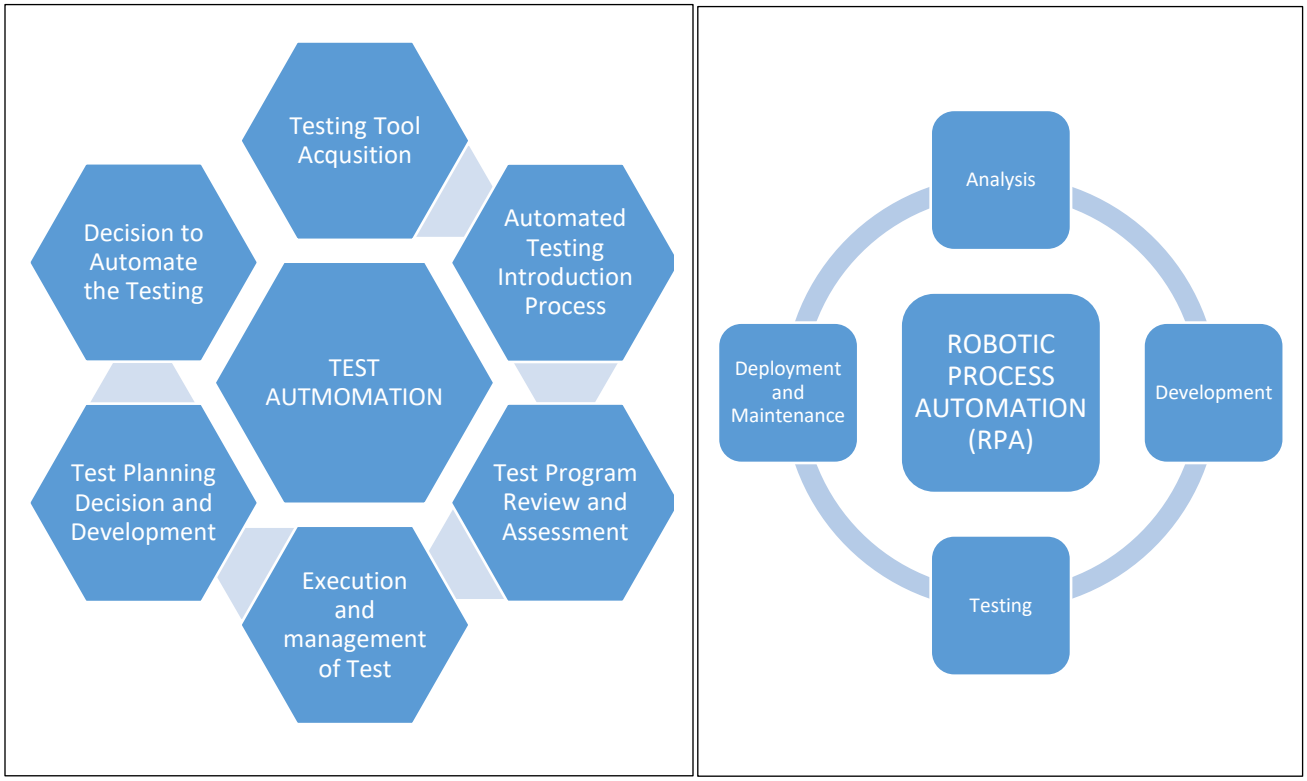

Figure 1 Difference between Test Automation and Robotic Process Automation

Table 1. Differences between Test Automation and RPA

S/N	Test Automation	Robotic Process Automation
1.	Test automation reduces test execution time through automation.	RPA reduces headcount with the help of automation.
2.	It automates repetitive test cases.	RPA can automate repetitive Business processes.
3.	Coding Knowledge is required to create the test Scripts in the test automation process.	The coding Knowledge is not necessary for the Robotic Process Automation in development.
4.	The test automation can be executed as per the instructions provided by the code.	Many RPA tools come with the artificial intelligence engine and process information like human beings.
5.	The products can be automated with the help of Test Automation.	The products, as well as services, are automated with the use of RPA.

5. Benefits of Robotic Process Accounting and RPA in Accounting Operations

Robotic Process Accounting is not a stand-alone solution for improving finance operations. RPA will produce the desired efficiency if the finance and accounting department conducts standardization and process analyses before implementation.

The benefits of RPA are different from traditional system integration. RPA is the bridge that connects the gap between disparate applications – it is seen as the final stage of automation. RPA stands to succeed where big finance system frameworks like Oracle and SAP fell short in terms of STP (Straight Through Processing), Robots integrate processes at the micro-levels where the big systems cannot. The result of robotic accounting includes reduced labor costs, cycle times, increased accuracy, and simplified workflows. Robotic accounting's benefits are both financial and operational, they include:

i. **Non-invasive Application:** Robotic accounting is both a bridge and a layer, sitting on top/across current infrastructure, reducing reliance on needs to change a company's IT infrastructure
ii. **Personalized Workflow**: In finance and accounting, RPA is not restricted to one part of a process, its application extends to multiple processes at a time; accounts receivable, accounts payable, expense management, controller work, financial close, financial planning and analysis, and even tax.
iii. **Nonstop performance:** Finance and accounting RPA has no working hour limitations. They can run 24/7/365, increasing productivity to levels traditional work cannot reach.
iv. **Consistency and Reduced Errors in Work:** Robotic accounting excels at error-free data movement with reduced output variability.
v. **Major Lifting:** With robots in accounting taking care of slow data entry type work, human workers are free to tackle high-value work where they are truly needed. You would not think it, but robots can make humans happier!
vi. **Ease and Speed of Installation:** The installation of a robot in the accounting processes of a firm can be done in less than a week, to best enjoy RPA and to achieve the efficiency for involving RPA in accounting processes, and analysis of the best part of a firm's accounting processes to install it has to be conducted.
vii. **Audit Trail:** RPA has fully maintained logs, which is necessary for compliance
viii. **Right Shoring:** The geographical independent nature of RPA allows right shoring without negative business case impact.

6. The Application of RPA in Accounting and Finance

RPA use cases in accounting and finance refer to documented steps of a process, that are opportunities where RPA could be implemented. Accounting and Finance RPA use cases enhance the needed preparation for automating data processing across systems. Use cases are accounting and finance operations process outlines used by professionals in setting up automated scripts for processing data across multiple IT systems

As obtainable in the adoption of new technologies, most operations executives of accounting and finance find it hard to look past already established systems and find places where opportunities in RPA can be applied. This is where these use cases come in. They serve as blueprints to adopting RPA by accountants.

i. *How RPA could be Applied in Treating Accounts payable RPA*: Vendor invoice processing cycle times were reduced by 60% by implementing a robot that aided accountants with the transcribing of inbound invoice information from PDFs (invoice number, data received, and dollar amount) into web-based SAP, internal use spreadsheets used for reporting, and by placing a final PDF copy on a local server to maintain SOX compliance.
ii. *Controller function RPA use case example*: Manual work time required to process weekly invoice data feed validation comparisons to previous week invoices received were reduced by installing an accounting robot that automatically reconciled the current period feed against the last period once the controller opened

the file. The robot then spits out any exceptions or rejections that required human review if they did not reconcile automatically.

iii. *Finance and accounting cost allocation RPA use case example:* Company units submitted the cost allocation data through Share Point, in forms of Excel spreadsheets, individual emails, or e-documents. All these were combined into one "master file" before uploading to SAP. RPA eliminated the manual way of merging data by scraping all of the inbound data submissions into the master file within one minute compared to two hours of computation before the robot was installed

iv. RPA use case example for Closure of Financial Reports – Processes for creating baseline reports were improved by employing RPA that automatically processed tax entries into QuickBooks from spreadsheets received from business units – this reduced manual copying and data transcription by finance managers by 85%.

v. RPA use case example Reconciliation of Accounts – the exception review process required reconciliation of accounting data from QuickBooks, multiple Excel sheets, and customer invoices.

7. RPA and the Place for Human Careers in Accounting

It is generally expected that most jobs will be lost in the nearest future as robots will take the place of humans in executing repetitive and routine tasks (Auerswald, 2012; Frey & Osborne, 2017). It is estimated that at least 30% of the majority of current occupations in the world will be automated and approximately 50% of current work activities have the technical potentials to be automated. Manyika, et al. (2017) estimates that the actual proportion of tasks that will be displaced by automata by 2030 is between 15% to 30%, which translates into 400 million to 800 million full-time equivalents globally. The study on OECD countries has shown that 56% of jobs are susceptible to significant changes in the way they are carried out due to automation (Nedelkoska and Quintini, 2018). Berruti, Ross, & Weinberg (2017) estimates that 43% of jobs in the finance and insurance sector will be potentially automated. World Economic Forum (2016) holds that routine-based, middle-skilled, white-collar roles, including data entry clerks, accounting and payroll clerks, and auditors are expected to be in less demand. Surveys by ACCA and McKinsey showed that more than half of the employees questioned were aware that some entry-level accounting jobs would not be performed by humans anymore (Kokina & Davenport, 2017; Accountancy Futures, 2018; McKinsey & Company, 2017). Some isolated opinions even suggest that humans may be perceived as an impediment to the growth of the accounting industry (Tschakert et al., 2016).

Projections about robots taking over human jobs or replacing whole positions could be disturbing, and the change in the work process may increase employees' reluctance to learn new technologies and create technology acceptance issues (Fernandez & Aman, 2018; Gotthardt *et al*., 2019). However, surveys show that the actual resistance to automation and innovation is not significant (Professional accountants, 2016). Nonetheless, research on the issue is not extensive yet, and some recent studies point at real challenges posed by RPA implementation. Employees are afraid that RPA will weaken their positions (Gotthardt et al., 2019), while clients are reluctant to adopt it because of data protection and transparency issues (Cooper et al., 2019).

The overall impact of RPA is seen as positive, and technology advancement is regarded as an opportunity rather than a threat (Professional accountants, 2016). However, robots taking over complete accountant roles require further research.

So far, humans have needed to compete with each other for jobs; now they may need to compete with robots. Kedziora & Kiviranta, (2018) suggest this fear materializes if employees are not properly engaged and made aware of RPA implementation. Employees who previously performed manual and repetitive tasks and who are now responsible for implementing, managing, and controlling robots find their job more satisfying, and their doubts and resistance to innovation decrease (Deloitte, 2018). Fernandez and Aman (2018) imply that people cannot be completely replaced by robots, yet the reduction of jobs is inevitable, so employees' fears seem justified to some extent (Spencer, 2018). Daugherty & Wilson, (2018) think the man-versus-machine view is old-fashioned and short-

sighted, and more attention should be paid to human-machine collaboration. Robots are no substitutes for humans but resources. They serve as digital or virtual assistants that will support humans in mundane and routine activities that might otherwise remain undone. With AI now automating unstructured accounting tasks, researchers perceive it as an opportunity for synergy and to receive support in decision making rather than only replacing humans (Kokina and Davenport, 2017; Marshall & Lambert, 2018)). Robots could replace human job positions, but not by their will, the design, configuration, and control of these robots is still done by humans (Kathmann, 2017). Humans still lord over robots, as such robots should not be seen as competition to humans, they are only complementing human jobs by taking off from humans those routine and mundane tasks to ensure faster productivity. The least human employees could do is to upgrade their skills to be useful in working with robots in terms of interpreting the output of these robots. Robots cannot interpret information output – this calls for collaboration.

The spheres of accounting activities that could be hijacked by robots include the day-to-day recording of transactions and the preparation of financial reports. Accordingly, transactions need to be processed and recorded to produce accurate financial reports afterward. Most of these operations, once their rules and workflows are well-known and documented, are repetitive and predictable, and thus automatable.

However, those rules and workflows have to be thoroughly designed to comply with accounting standards and audit requirements. An accountant's biggest asset is his/her professional expertise. Applying IFRS/GAAP, income tax/VAT regulations, and listed companies' disclosure obligations needs interpretation and requires experience which has been accumulated over the years. Regulations are subject to frequent changes, and their volume and complexity are growing (Chychyla, et al., 2019). Accounting and financial reporting standards require accountants to exercise professional judgment, and make assumptions and estimates (e.g. with valuation models, impairment, or provisions measurement). Shifting predictable accounting tasks to robots allows accountants to focus more on a detailed analysis of the scope of regulations and the impact they have on accounting operations and financial reporting. The proportion of employees' time spent on routine tasks and those requiring judgment and discernment will reverse, and thus, time will be used more productively.

The released time can be spent on acquiring new skills and higher value-added activities. Workload related to traditional data input and compilation has decreased since the introduction of computers. The decrease progressed through the introduction of ERPs, and now because of robotization. The transformational effect on the accountant's role was recognized after the implementation of cross-functional integrated ERPs. The position of accountants was raised to information providers and analysts (Desormeaux, 1998; Scapens, 1998). If robots are to automate another part of the accounting work, accountants could use the released time to turn themselves into strategic business advisers, fraud and compliance experts, or technology or RPA leaders (Parcells, 2016; Chartered Accountants Australia and New Zealand, 2017).

The center of their activity will shift from accounting operations, audits, and preparing reports and statements towards data analysis and interpretation, leading to more informed decision-making. The amount of data generated by robots and automata will require proficiency in extracting the essential relationships and facts, describing their context, and the ability to concisely present the findings (McKinney, Yoos & Snead, 2017; Borthick & Pennington, 2017). Finance teams are expected to devote much more time to decision support, predictive analytics, and performance management (Axson, 2015). There will be more opportunities to gain informative insights and draw valuable conclusions out of the data, which accountants already are well prepared for, but they had to use most of their time to prepare the data (Richins, et al., 2017). The accountants could, to some extent, work as data scientists, which will require both core accounting expertise and a theoretical and practical understanding of data and analytics (Warren et al., 2015).

Accountants have a natural competitive advantage compared to other professionals as they understand the interrelationships between different business segments (Howieson, 2003). They realize how data build financial statements and how they relate to strategy (Richins, 2017). To act as business advisors, they will need to intensify

cooperation with different corporate functions and departments. Therefore, good communication and collaboration skills will be increasingly sought-after. The cooperation will offer the opportunity to abandon the silo approach and enable an integrated one. There are estimates that most traditional financial services will be delivered by cross-functional teams, and their activity will go beyond accounting and transaction processing (Axson, 2015).

Robots can undertake predictable and repetitive business operations, but not without prior training and testing. Accountants who are already professionals in these business operations can take advantage of their knowledge to prepare, monitor, and optimize robot operation and act as RPA consultants or managers (Kokina and Davenport, 2017). The employees that used to perform the tasks are the best source of expertise and have a perfect understanding of all the nuances of the tasks or processes to be automated (Association of Chartered Certified Accountants, 2018).

Their responsibilities could include designing step-by-step instructions that follow business rules, and which are then used to configure or train robots. Every time regulations or business requirements change, the robots will need to be retrained and retested (Market Research Future, 2019). Audit and compliance protocols for automated processes have to be implemented, as well. The robots already in operation need to be supervised (usually in a centralized way). Employees will need to intervene manually in cases triggering exceptions that stop robots from completing their tasks. Non-technical anomalies (e.g. fraud related) could also require an in-depth analysis. Humans are responsible for assigning tasks and governing processes in terms of priorities and the available robot capacity. Task completion and audit logs have to be verified and monitored. Also, employees must track the robots' performance and collect feedback from other departments to identify bottlenecks and spaces for process optimization. These observations are useful during periodic reviews of robot algorithms.

The new roles (and those which do not yet exist) of the future accountant, combined with the presence of co-working robots, may result in changes in the organizational structure. Automation solutions have been found to produce various social effects. Desormeaux (1998) found that ERP implementation raised the accountants' role, while Arnold (2006) pointed to the unexpected impact they have on the role of managerial accountants. Now, the change in the structure may be a derivative of the degree to which the robots blend into human teams and whether they act as assistants rather than competitors. A question arises if the organizational structure becomes flatter, as observed after ERP implementation (Davenport, 1998). Further research is also needed to investigate the effects of human-robot collaborations and potential consequences on employee motivation and satisfaction. The research could explore those areas from the perspectives of regular accountants, managers, and IT professionals.

Future accountants will be responsible for three major areas. Firstly, some will handle the core accounting but with the focus shifted from recording transactions towards the application and interpretation of accounting and reporting standards. Secondly, they will use their knowledge and problem-solving skills in cross-functional teams to deliver strategic advice. Finally, their expertise will be crucial in managing robots and implementing other emerging automation solutions for accounting tasks.

5. Conclusion

Robotic Process Automation can deliver significant improvement in risk coverage, productivity, and cost. RPA is rapidly gaining popularity as an efficient enterprise tool. Through automating low-value monotonous human activities, Robots can boost business productivity, build consistent quality, and assist operations scale. The adoption of RPA can deliver as much as a 75 percent cost-effectiveness against traditional BPO (Business Process Outsourcing). RPA usage also ensures better business security as bots are the drivers of productivity, delivering wider risk coverage. However, determining where, how, and when to use this automation tool is only when the value for its invention could be derived.

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