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FINANCIAL ACCOUNTING: AN EXPLORATORY DICHOTOMY BETWEEN MACROS AND ROBOTIC PROCESS AUTOMATION (RPA)

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Abstract

The 4th industrial revolution has created a scenario where automation has become the order of the day. Given the dynamic nature of businesses and financial accounting today, this work looks into the aspect of automation in this field. Using Microsoft Excel and UiPath as case studies to show the differences between macros and Robotic Process Automation, this work was able to establish, through related text, the importance and viabilities of both technologies. Going further, this work looked at the major differences that set them apart but concluded that in some cases, both technologies working hand-in-hand is a better option.

Keywords: RPA, Automation, Macros, Financial Accounting

Introduction

Financial accounting is that branch of accounting that has to do with the coordination and processing of expenses with the major objective of identifying all expenses made over a period of time. Activities of financial accounting often involves, summarizing and reporting a company's business transactions through financial statements which are contained in the income statement, the balance sheet, the cash flow statement and the statement of retained earnings (FreshBooks, 2021).

As with anything that has do with a means of exchange that has value, in this regard, fiat, the lesser the error, the better for all involved. This is what gives credence to financial institutions and the tools they use to accomplish this task, which in turn improves confidence from clients and often translated to increased patronage. This makes it possible to track expenditures and analyze and identify pitfalls that could endanger the corporate financial existence of the company; suffice to say, a little mistake in this field could have a bad cascading effect in the overall corporate governance of any organization.

Financial transactions and the time spent to address customers' transactions are properties that present day and forward-thinking organizations must possess. Human efforts in minimizing error have been geared towards automation. This has been a driving force seen as early as the first industrial revolution but more pronounced in the 3rd and 4th revolutions. As earlier stated, errors can be fatally damaging to organizations as seen in the 2013 IRS civil penalties meted out to U.S. businesses amounting to $7 Billion due mainly to incorrectly reporting business income and employment values (Berry, 2015). Accounting mitigates against error by making use of accounting tools that automate calculations, track dependencies, and analyze results. Because repetitive tasks are often time consuming and prone to error, much more sophisticated tools geared towards the automation of such financial processes are continually developed and improved upon.

Two major technologies employed for financial operations are macros and Robotic Process Automation. Although similar in goal, that is automation of financial processes, they are often misrepresented in methodology and scope. Given the aforementioned, this work therefore seeks to carry out an exploratory analysis of what makes both technologies effective tools while identifying their limits. This work makes use of Microsoft Excel macros and UiPath, the most popular RPA tool to demonstrate their capabilities.

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Literature Review

Accounting involves taking cognizance of the activities of anything and with regard to business, all processes geared towards the day-to-day operations of any organization. It could take the form of tracking the number of items in a store, or counting the number of customers that make use of a bank's automated teller machine (ATM) per geographical location thereby giving insights into records taking, classification, summarizing, and analyses of all the transactions that are carried out in an organization. Accounting, in the economic sphere generally has to do with all of a company's financial transactions which may include the policies and procedures for expenses, data management and the generation of financial reports while financial accounting is concerned specifically with the generation of these reports and ensuring that they are based on accurate information by following generally accepted accounting principles (FreshBooks, 2021). Figure 2.1 sheds more light on the differences between general accounting and financial accounting.

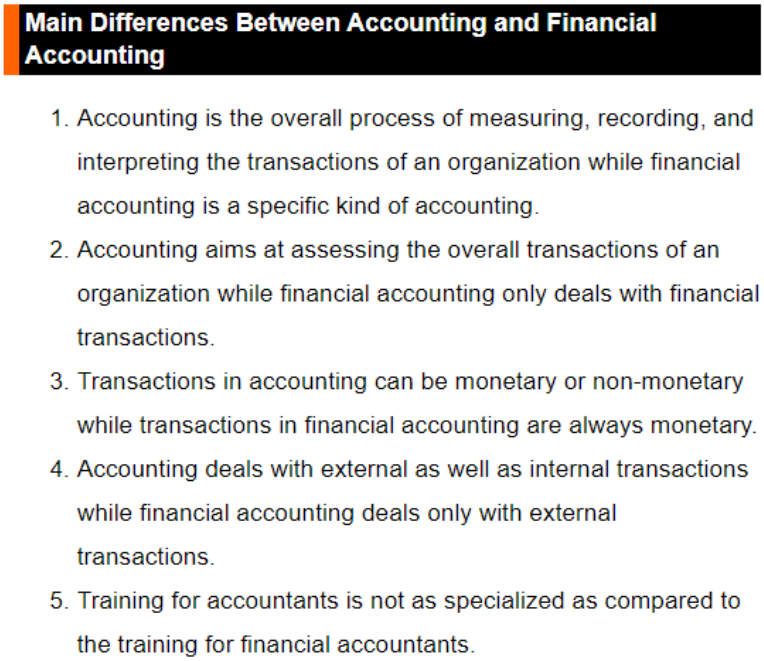

Figure 2.1. Accounting vs. Financial Accounting (Askanydifference, 2021)

As organizations continue to integrate automation into their business processes coupled with the advancement of Artificial Intelligence, the fourth industrial revolution has seen a jump in the seamlessness and precision of doing business globally. This portends greater efficiency and reduction in waste and error as we gradually move to the 5th industrial revolution where higher margin responsiveness will be of paramount importance. This 5th industrial revolution in turn is envisaged to flourish humanity in the sense of ensuring the use of technology for not only economic but social advancements and creating quantum leaps for humanity (Gauri, 2019). The need for automation itself cannot be overemphasized as the price of errors, no matter how small, is too costly. According to Access (2021), the advantages to automation includes improved efficiency, reduced error rate, better collaborative work, reduced cost, increased profit, and expunged barriers to growth. Fuscaldo (2019) posted that financial services companies have already seen big boosts in productivity and efficiency thanks to automation while stating that it has saved banks $12 Billion, insurers $7 Billion and investment firms $4 Billion. Macros are commands that are used to automate repetitive tasks within an environment. As most financial activities are repeated daily activities, for example, balancing income and expenditure or accounting for the number of products manufactured on a daily basis and all its other coordinating activities. Macros are indispensable tools that can be used to carry them out. The emanate from programming the objects found within the application tool and are capable of interacting, triggering, and activating commands. Within the Microsoft Excel environment, the use of Visual Basic for application, a programming language built for Microsoft office suite applications, can be used to further advance the automation processes of macros but macros in itself serves as a tool used in the stead of programming. Richardson (1990) describes macros as pseudo-programming that is automating activities without the need to delve into programming in-depth although a fusion of both makes

automation possibilities comparatively unlimited. Recording Macros activities has the weakness of requiring precision because a wrongly formatted worksheet is bound to fail in carrying out the macros' intended activities. Lux & Knight (2021) made use of macros to automate processes for detecting academic misconduct in financial projects. They identified that technology makes it easier for students to cheat and by making use of their developed Macros for 1,611 Excel projects, they were able to know when a student submits another student's file, disable copy/paste functions across workbooks; Record username, computer name, date/time; Logs number of Excel files open and names of files, and generate logs of student toggling between open Excel files. Further coding was able to workbooks; Record track all cell changes. Their work came with the advantage of being inexpensive to implement and can be re-sued multiple times. Their results showed that 56.9% of the students admitted that the macros were effective in the prevention of cheating while 54.9% agreed that it was able to detect cheating. This work showed how automation can act as a check and balance mechanism. However, how much computational requirements was needed for the logs of data generated with respect to an increased number of projects as an implementation factor must was not addressed.

Maydonovich (2020) automated the preparation and presentation of financial and statistical accounts of companies using the spreadsheet in MS Excel and teaching these processes to students. Making use of a combination of in-built excel functions, the use of Macros saved time and increased precision in the delivery of reports. The work taught students how to prepare income tax, accumulative pension benefits, and quarterly financial reports as well as teaching students how a combination of these functions can be used to automate report generation. Students were also introduced to the process of creating new functions and macros on the spreadsheet in MS Excel by using VBA (Microsoft Visual Basic for Applications).

Golova, Gapon, and Baranova (2020) elucidates the importance of financial automation with regard to agricultural crop production. Given that automation is data driven, the work was able to show financial accounting as an indispensable provider of data for managerial decision-making of all agricultural enterprises. Analysis show that results may not always be precise due to the dynamic nature of agri-business and so therefore, automation should be flexible enough to accommodate new procedures that may enhance result based on better result-oriented data generation. They proposed the 1C system with additional functions, which allowed enterprises to regularly receive data that are most important to them during harvesting and sowing seasons and allowed enterprise management to make informed decisions to increase the intensity of work and optimize the timing of their implementation. Their system generated Real-time control of harvesting and sowing work in crop production, identified aspects in agricultural work to timely adjust certain indicators and optimize processes and provided financial accounting reports. They posited that the method was not full prove in the generation of financial accounting reports during the period of agricultural work.

Jones, Long, & Stanley (2019) using case studies employed a realistic scenario to test students' knowledge in the area of financial accounting bordering on analyzing transactions and preparing the appropriate journal entries, book adjusting, closing journal entries, and preparing a set of financial statements for the purpose of providing students with a comprehensive review and integration of intermediate financial accounting concepts and cultivating the skill of flexibility in the report generation and analyses of activities which helps in spotting anomalies that is Auditing.

The papers reviewed show that automation is the key to error prevention and time saving. Macros are a veritable tool for achieving automation goals and can be implemented in every sector of accounting depending on the need but are environment dependent.

Robotic Process Automation (RPA) excels at automating manual and repetitive tasks. It is a tool that can be used to automate all the work that is often done manually thereby freeing up more time to attend to other activities. RPA allows software robots to carry out tasks on a computer just like a human would (Mullakara & Asokan, 2020). Simply put, it is a technology that deals with automating cumbersome processes that can be repeated and borders on reliability. In RPA, the developed solution is either called robots, software robots, or bots and are activated to save time in carrying out transactional processes.

Mullakara and Asokan show that the benefits of RPA are as follows:
"1. Improved productivity: More than 60% to 90% of the repetitive effort can be removed, with RPA increasing the output for each of your employees.

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2. Rapid results and in-year benefits: Rapid implementation and results are a key promise of RPA as you can conceive, design, develop, and deploy in weeks, not months or years.
3. Low startup costs: Each of the bot licenses is less costly compared to other software tools and the bot can perform the work of about two to three Full Time Equivalent (FTE), ensuring the startup costs are low.
4. Reduced processing costs: The costs of processing are reduced drastically as the bot costs around one third to one fifth the cost of an employee, depending on location.
5. Improved quality and accuracy: Your bots perform assigned work with 100% accuracy, thereby reducing any rework that may have been required.
6. Improved compliance: RPA activities are logged and can be reviewed at any time. This gives you a greater degree of oversight and control over your operations.

Kaya, Turkyilmaz, & Birol (2019) studied the impact of RPA Technologies on accounting systems by analyzing the implementation and improvement areas of RPA in Enterprise Resource Planning (ERP) and Materials Resource Planning (MRP) within the scope of financial reporting systems in the context of changing cost accounting systems. Their work also defined the effects of RPA technologies in traditional accounting and cost accounting processes and outlined the thorough connection between accounting systems, Industry 4.0 and RPA technology. They show that Robotic Process Automation is a combination of related technologies such as autonomic systems, machine learning, AI and robotics. They conclude that RPA and other related technologies will reduce the dependency of human work, reduce costs and increase efficiency in business operations. They further posited that RPA will especially improve error-free and accurate transactions in accounting and increase the efficiency and effectiveness in monitoring and auditing transactions.

Qiu & Xiao (2020) posited that the widespread application of Robot Process Automation (RPA) in the financial field has become an inevitable trend with respect to cost and identifying problems that the current system has, that is cost accounting is not timely, and the cost analysis report mode is too fixed. Using Robot Process Automation (RPA), cost management process optimization and improvement were made on the system of data acquisition, "Cloud Purchasing Platform" construction, and comprehensive multi-dimensional cost analysis. Their work also lays credence to the importance of RPA in today's financial sector as it enables the automation and generation of data for precise decision making.

Dong (2021) showed that RPA has a great influence on traditional financial tools and accounting because of its characteristics of precision, reliability, high efficiency, low consumption and rapid response while Januszewski, Kujawski, & NataliaBuchalska-Sugajskaa, (2021) describes the advantages and disadvantages of RPA using the concept of a novel research planned to be carried out in Polish accounting firms providing accounting services to micro and small enterprises. The accounting firms consisted of around 36,000 active entities providing services to as many as about 2 million entrepreneurs. The principal objective of the research was to determine the extent of Robotic Process Automation in Polish accounting firms. The results show that Robotic Process Automation is justifiably able to keep up with accounting technology and IT, towards a reorganization of accounting processes in the sector of micro and small accounting firms due to significant changes provided for in the Accounting Act amendments introduced in 2018.

The works reviewed so far looked into financial accounting from an automation perspective. They show both macros and Robotic Process Automation and not just viable tools but necessary for today's ever changing financial rules and regulation. With speed being a major determinant for decision and organizational sustainability, automation is creating new frontiers and can only become justifiably more important as time goes on.

Macros And Rpa Tool

The tools selected to show the differences between Macros and RPA technologies are Microsoft Excel and UiPath. Microsoft Excel is a world leading spreadsheet application used for storing, processing and analyzing numbers. It is a trusted financial tool used in major banks and other financial institutions. Recording a macro in Microsoft excel is usually started by going to the view tab and selecting the record macro option from the drop down.

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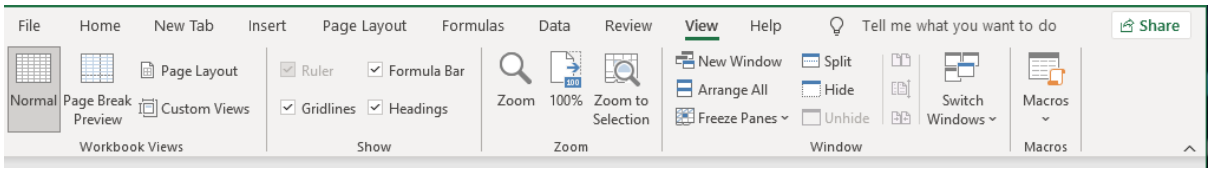

Figure 3.1. Recording a macro

As with most object in computer applications, a macro can be customized to have a unique name, its scope can be determined that is a description can be given to throw more light on if function. A short cut key to activate the macro at any time can also be given.

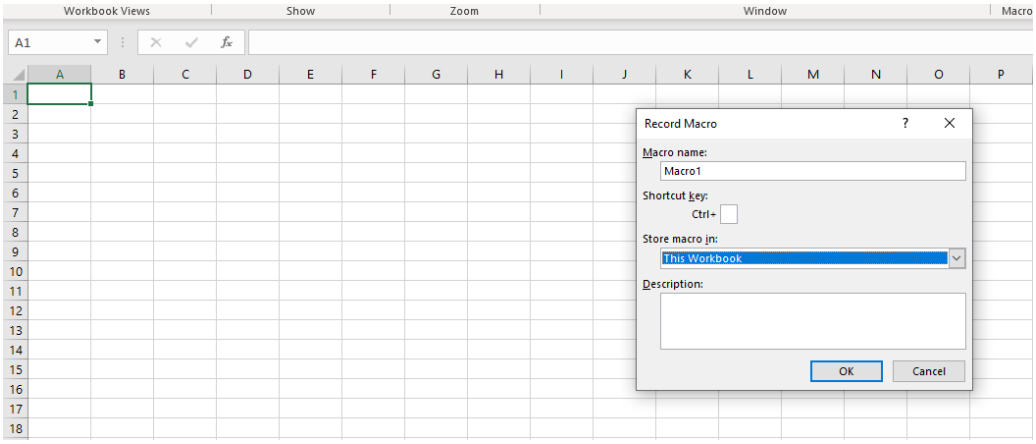

Figure 3.2. Customizing a macro

UiPath studio is the world leading tool for creating bots to automate processes. Although there are a few other tools like automation anywhere and blue prism, UiPath has sown increased patronage over the years.

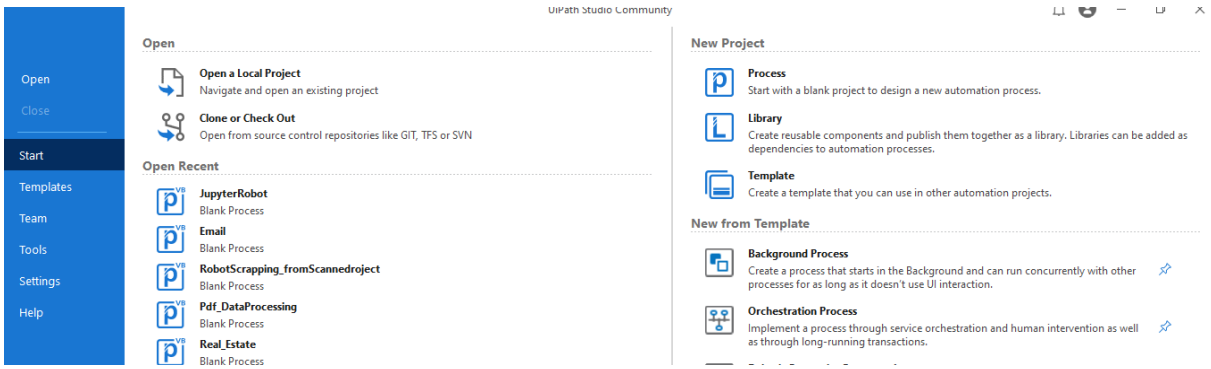

Figure 3.3. UiPath Studio

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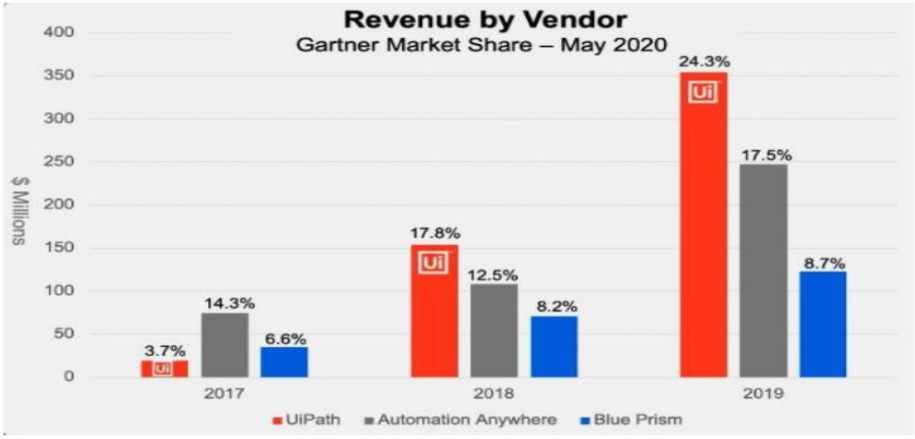

Figure 3.4. UiPath vs other RPA tools (Mullakara, 2020)

In UiPath, a new robot is started by creating a process. It contains all commands and functionality required to build a software robot that can interact with other applications.

Dichotomy Between Macros And Rpa

The most important contrast between macros and RPA as established from the literature review is the scope. While macros can only work within the confines of an application environment, RPA robots can interaction with web and desktop applications.

RPA bots have the ability to push buttons on web pages, anchor tags to reference purpose in dynamic web pages, data scrapping, creates variables and store information, carry out if-then analysis, automate e-mail responses, and so many other functionalities.

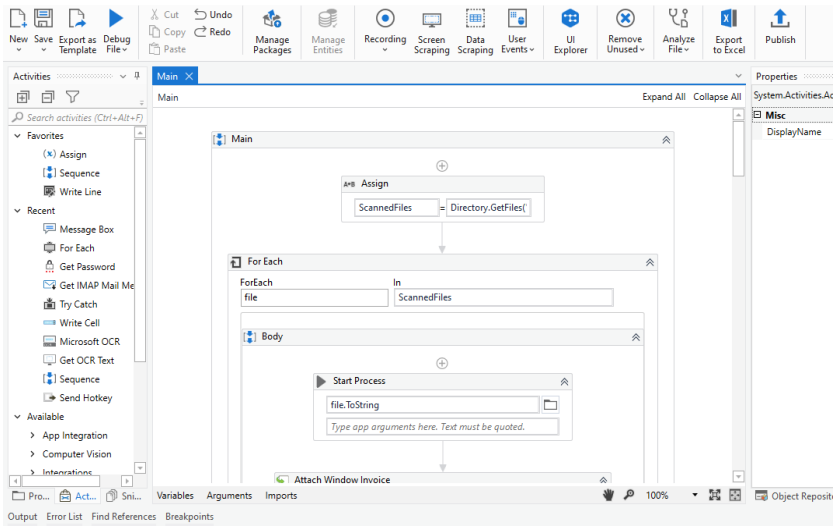

Figure 4.1. RPA process showing a cross-section of activities

Another major difference between macros and RPA is the ability to make use of computer vison. This gives bots the abilities to read text from all form of document types likes receipts and invoices and store/and or process such information.

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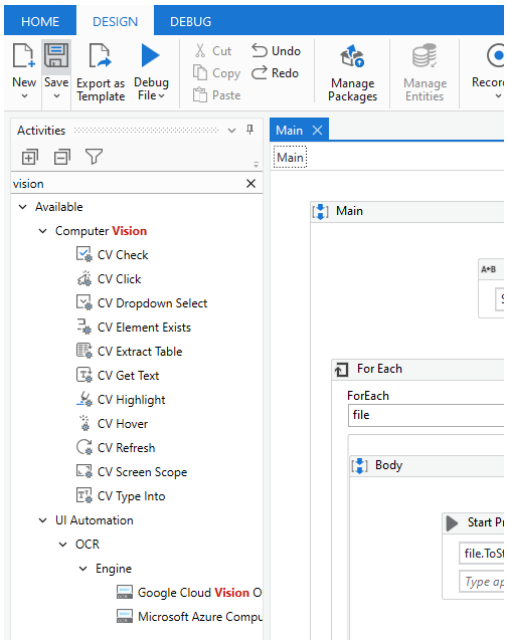

Figure4.2. Cross-section of UiPath computer vision activities

Perhaps the most important feature of RPA is its ability to work with MS Excel which in turn enhances the automation process of financial accounting. This makes it easy to start a process with the robot and end it using macros in the long run, this saves time and eliminates error.

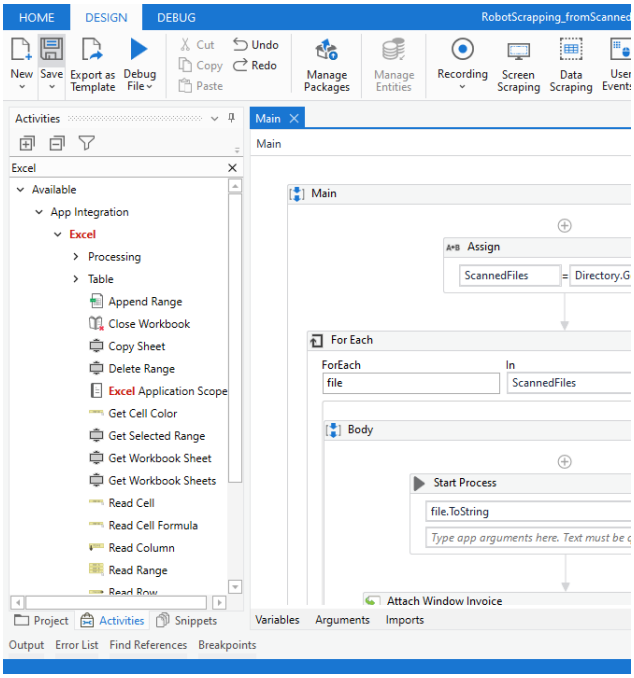

Figure 4.3. A cross-section of UiPath Excel Activities

Another import aspect of RPA bots is their ability to have attended and unattended automation. Attended automation assistants run on computers and help complete parts of the tasks like real-time human-system interaction while unattended automation run on a schedule, usually on a server to carry out tasks (Mullakara & Asokan, 2020)

Conclusion

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This work delved into the process of automation and its impacts on financial accounting. Looking from a Microsoft Excel macros and Robotic Process Automation perspective, this work was able to show why automation is important and a viable tool for today's businesses. It looked into what makes each of these technologies thick and their abilities. Robotic Process Automation is the clear winner with regards to today's dynamic financial business demands but this work was also able to establish that in some cases, both technologies work hand in hand to give better results.

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