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Robotic Process Automation in Government

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ABSTRACT

Robotic process automation (RPA) is the process of using robotic software technology to automate digital tasks and replace manual processes with digital best practices. It includes any software tool or utility that replaces repetitive, labor-intensive tasks with an automated process. It is a relatively new software technology used for automating high volume and mundane business processes. RPA is transforming government operations by streamlining time-consuming tasks and improving service delivery. It is used in government sector for several reasons, including its ability to automate mundane and repetitive tasks, reduce costs, and free up human labor for more strategic duty. Examples abound of the technology being used at the global, federal, state, and local levels. The purpose of this paper is to explain the adoption of robotic process automation (RPA) in the government sector.

KEYWORDS: *automation, robotic process automation, RPA, government, public service.*

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INTRODUCTION

It difficult to overstate the role technology plays in the way governments operate. Governments have learned the hard way that it is next to impossible to operate in the 21st century without technology. With electronic permitting laws being passed in states like New Jersey and Florida back in 2021, the writing is on the wall that local governments will be going through a digital revolution in coming years [1]. A component of the revolution is the robotic process automation (RPA). There is a transition trend toward "digital government" and consideration for new technologies adoption at scale, including RPA.

Robotic process automation (RPA) uses software tools driven by rules to automate predictable routines and predictable tasks through coordinated actions that mimic human behavior. RPA employs software bots that mimic human actions to interact with existing applications, systems, and data sources. These bots are designed to perform simple, time-consuming, and rules-based tasks such as data entry, form filling, document processing, and report generation. Just like people, these robots are able to leverage a computer screen, keyboards, online systems, and data to get work done for a government entity without the labor cost or risk of human error. With RPA handling simple but time-consuming tasks, municipal workers can spend their time on more important work.

WHAT IS ROBOTIC PROCESS AUTOMATION?

Among the various forms of artificial intelligence, RPA stands out for its potential to significantly increase workforce productivity by reducing or eliminating the need to do repetitive tasks manually. Popular applications of RPA include data entry, data reconciliation, spreadsheet manipulation, systems integration, automated data reporting, analytics, email notifications, acquisitions, administrative services, finance, human resources, mission assurance, strategic communications, travel reimbursements, claims processing, and customer outreach and communications. These are just a few examples of the ways RPA is being used to remove the burden of manual, repetitive, and duplicative tasks from public service workers [2].

Robotic process automation is a form of automation software. It is a technology that can automate

repetitive, rules-based tasks. Like an Excel macro operating within a spreadsheet, RPA can record actions performed across a personal computer, access systems, and perform specific tasks for human users. It uses software robots, more commonly called "bots," that mimic basic human-computer interactions. Figure 1 shows the symbol of RPA [3], while Figure 2 shows processes that RPA can automate [4]. Most industries use RPA. The government does too. Due to the repetitive nature of some tasks, the probability of human error increases. One way to eliminate errors is by using RPA.

Robotic process automation solutions fall into three key categories: attended RPA, unattended RPA and hybrid RPA, as shown in Figure 3 [5].

Robotic process automation is a type of software that mimics the activity of a human being in carrying out a task within a process. It is a technology that automates repetitive tasks using software robots. RPA uses a set of automation tools to automate repetitive tasks and manual processes performed electronically. Since RPA can automate tasks that are rule-based, manual, repetitive, and tedious, delivering the highest levels of accuracy and eradicating human errors, it is a seamless fit for the finance industry. Here are some specific examples of what RPA in finance can do [6]:

- Opening emails and joining attachments
- Automatically logging into various applications on the web
- Shifting folders and files
- Copying and pasting
- Completing forms
- Collecting data from databases and the web
- Making calculations
- Connecting to system API
- Extracting structured data from documents
- Gathering stats from social media
- Following if/then decisions and rules

Some of these tasks are displayed in Figure 4 [5].

At its core, robotic process automation (RPA) is a tool designed to mimic rule-based business processes, performing them seamlessly and without fatigue. RPA is a rule-driven method that is limited in its application. The technology functions much like a Microsoft Excel macro; the key difference is in power and reach. It follows set rules, similar to how an Excel macro works, to do things like move files or log into accounts. Growing as a popular solution in finance and accounting, RPA refers to software technology or "software robots" with artificial intelligence (AI) and machine learning (ML) capabilities. The "software robots" have the ability to learn and complete a high volume of rules-based, repetitive tasks, and business processes. They have the capacity to operate much faster than humans, with 100% precision and reliability, working around the clock.

Finance and human resources are just two examples of departments likely to have many use cases that RPA can help solve. Some examples of good use cases for RPA in finance include processing customer orders, ensuring timely vendor payments, and managing period ending financial close processes. For human resources, some examples include employee onboarding, time tracking, and leave of absence management. Processes where human judgment is needed are not appropriate for RPA since RPA automations rely on clear, consistently applied rules [7].

Along with RPA, one should be aware of both business process automation (BPA) and digital process automation (DPA) – two commonly used automation technologies that robotics process automation can be paired to optimize and streamline a digital transformation. BPA refers to the use of technology to automate complex, multi-step workflows, typically very specific to a company's core business functions. DPA offers dual power by automating processes from end to end, and optimizing common workflows that involve external human interactions (i.e. sales, management). Separately, RPA and AI are quite powerful, but leveraging them together is undoubtedly advantageous to any financial institution. When deployed together, AI is the "brains" behind RPA's bots [8].

ROBOTIC PROCESS AUTOMATION IN GOVERNMENT

Robotic process automation (RPA) in government uses software "robots" to automate repetitive, rules-based tasks, improving efficiency, accuracy, and speed in citizen services, data processing, and administrative functions like permit processing, tax filing, and procurement. The federal government and other public agencies have adopted RPA to streamline operations, though agencies must also address risks related to data security and the proper management of automated processes. For governments struggling to recruit new public workers, these systems can replace certain administrative roles, thereby saving money for government budgets and allocating more funds to improve constituent services. These tasks are related to clerical work and data-entry for businesses and government agencies or perform tasks that are tedious and time consuming to save manpower and resources for municipal workers.

RPA has already demonstrated its ability to reduce costs and increase efficiency in multiple industries, prompting officials from governments and the public

sector to consider it as a potential solution for enhancing citizen services. RPA is increasingly becoming popular as a way to speed up government work. Work related to administrative data-entry and reporting roles that previously required hours to complete can now be done by a robot software in significantly shorter periods of time.

APPLICATIONS OF ROBOTIC PROCESS AUTOMATION IN GOVERNMENT

Robotic process automation (RPA) is software that is designed to accomplish simple-tasks that formerly needed to be done by the human workforce. RPA is being put to work in widening range of applications, including efforts to streamline data collection and processing, document management, identity verification and to respond automatically to citizens' information requests. With the ability to automate tasks with RPAs, governments can address understaffed, overworked departments, spend less time recruiting government workers, and eliminate inefficient manual processes. Common application areas include [1,9,10]:

- *Automation:* Governments have to deal with repetitive, labor-intensive tasks like document processing, information dissemination, data management, and security compliance. Manual data entry is prone to mistakes that can cause delays and dissatisfaction among applicants. Tax calculations often involve processing vast amounts of data, which can be both time-consuming and error-prone when done manually. RPA helps by automating data extraction, validation, and routing tasks, ensuring faster processing times. By automating this process, governments can save time otherwise spent on manual audits and assessments. This eliminates bottlenecks and reduces the burden on employees while improving the citizen experience. Processing tax refunds manually can be frustrating for citizens and time-intensive for employees. RPA reduces processing times by automatically verifying taxpayer information, matching it against records, and flagging potential discrepancies. RPA can be used to automate applications for and renewals of driver's licenses, passports, tax forms, and records about employment, healthcare, and insurance coverage.
- *License Registration:* Constituents and business-owners now wield the power to file for licenses online, at any time. License requests will be automatically accessible from the cloud, meaning municipal workers can approve or deny requests directly from the software application no matter where they are working from. These include business registration, pet licenses, volunteer registration, and contract management.
- *Court House:* Your local courthouse has the potential to drastically reduce the amount of time spent on administrative tasks with court management software. When a constituent requests court records, court-hearing transcripts, robots can automatically send out the relevant documentation, saving a municipal worker time on the task.
- *Online Returns:* An RPA you likely interact with is online merchandise returns processing. When you start a return, the bot generates a message that confirms the return, issues a return receipt, adjusts the payment, and updates the merchant's inventory. Using RPA software allows workers to focus on more complex return processes or customer service issues.
- *Agentic Automation:* RPA has gone through several evolutions, first with intelligent automation (IA), then with artificial intelligence (AI), and next with enterprise AI. Now, we are in the next phase of automation: agentic automation, or agentic AI. In agentic process automation, AI agents can complete more complex tasks with minimal human intervention. Simply give them a goal, and they will find the best way to achieve it.
- *Global Usage:* Examples of global uses of RPA abound. There are a number of federal agencies that are implementing RPA tools. The US federal government is pursuing robotic process automation technology to increase efficiency and effectiveness. Navy has implemented RPA bots to capture screenshots of authorization letters for purchase orders. A city government in Japan has used RPA to reduce staff workload, improve service delivery to citizens, and resolve the challenges of new staff hiring and orientation. In the United Kingdom (UK), one of the largest government department agencies has automated routine tasks, increased efficiency and improved decision making. In Ireland, the Health Services Executive, which is the agency that provides all public health services to hospitals and communities throughout the country, has created their own RPA Centre of Excellence. Belgium is using RPA bots for job matching employment opportunities, focusing on workers competencies instead of just professional experience or education.

BENEFITS

Robotic process automation (RPA) is transforming how government agencies operate, saving time,

improving efficiency, and enhancing service delivery. It is an increasingly popular option for government agencies with legacy technology systems, complex workflows, and backlogs for approving applications for services. The government's program has improved with assistance from the software robots who can work unaffected by fatigue around the clock. RPA minimizes human errors that can occur during high-volume manual data processing. Other benefits include the following [11]:

- *Automation:* Automation is a smart, modern option to keep municipalities operating efficiently despite roadblocks or a lack of employee manpower. Automation programming has empowered humans to create a set of instructions to allow machines to mimic human knowledge extracted and learned from data sets and experiences. By automating mundane tasks, RPA frees up government employees for more complex work, reduces operational costs, and enhances overall citizen satisfaction. Automation reduces the need for extensive manual labor in repetitive tasks, leading to lower operational costs. Staff are freed from mundane, repetitive work to focus on more strategic, complex, and value-added activities. Robots can operate 24/7 without breaks, vacation, or sick days and can yield dramatic improvements in accuracy, cycle time, and productivity in transactional processes.
- *Minimizing Errors:* Manual processes often result in errors due to the volume of data being processed and human oversight. Payroll errors can lead to employee dissatisfaction and additional administrative tasks. RPA reduces errors by automatically verifying information and flagging inconsistencies. By minimizing errors and inefficiencies, governments avoid penalties and rework costs. This fosters trust between citizens and the government, as services are delivered more efficiently and reliably. Because there is no human involvement in the process, bots maintain the quality and accuracy of migrated data.
- *Cost Savings:* Lesser operational costs are another outcome of using RPA for document handling and validation. RPA reduces operational costs by automating labor-intensive tasks, eliminating the need for extensive manual effort. Government agencies save resources by cutting down on paperwork, streamlining workflows, and reallocating staff to higher-priority areas. The cost-effectiveness of RPA not only optimizes budgets but also enhances service delivery without compromising quality.
- *Time Savings:* Bots can perform tasks with speed and precision, leading to faster service delivery and increased output. Whether we are dealing with payroll, updating records, or validating data, they can be completed with perfect accuracy using RPA in a third of the time it takes to process them manually. The effectiveness and productivity of governmental institutions get increased by using bots in the workforce.
- *Legacy Systems:* RPA is particularly beneficial for governments with legacy technology systems, as it allows for automation without requiring significant system overhauls.
- *Building Trust:* With the accessibility to file paperwork online, and reduced amount of time it will take for government workers to approve or deny applications, constituents will appreciate government innovations and have more trust in their local government officials.
- *Collaboration:* With relevant documentation, data, and records stored in the cloud, municipal workers across departments can access paperwork and collaborate with ease, eliminating traditional, unnecessary obstacles caused by paper-based processes and single use software.
- *Customer Satisfaction:* Certain points in any customer experience journey will benefit from the "human touch." But for other areas, RPA technology offers many advantages for your customers. For example, RPA chatbots can also answer customer queries in real-time, 24/7. By taking care of laborious tasks, RPA gives your human customer service agents the time to manage more complex customer issues. They can focus on providing excellent personal responses for better customer satisfaction.

Some benefits of RPA are depicted in Figure 5 [5].

CHALLENGES

While one appreciates the benefits of RPA, the prospect of navigating from proof-of-concept to deployment can be quite intimidating. Adoption of RPA in the government and public sector faces several challenges. Among the key challenges include a lack of transparency in data processing and analysis and inadequate privacy and security protections. Other challenges include the following [12,13]:

- *Bias:* In order for bots to operate effectively and be free from bias, they need to rely on information that is accurate and representative of the users being served. Anything that reduces the representativeness or completeness of the data

introduces potential errors into the processing and must be avoided.

- *Transparency*: Having transparency in data processing and analysis is important. Both federal employees and the customers/clients being served must understand how bots operate and where they are drawing information. Being transparent about choices and processes aids the user experience and builds confidence in the applications.
- *Lack of Portability:* Automations built on a specific RPA platform are not always portable to other platforms. RPA tools can tightly couple agencies to a specific vendor. Vendor neutrality, support for different features, and rapid changes in pricing are to be expected.
- *Limited Ability:* RPA tools by themselves cannot dramatically improve the user experience of government services. Processes that are complex, require multiple steps, with multiple review and approval stages, often place an enormous administrative burden on those that use them. RPA is most effective when applied to well-defined processes with clear goals. Good candidates for RPA possess some or all of the following characteristics, they tend to be: static rules-based processes, requiring minimal human input or decision making; repetitive in nature; can be performed during off-peak hours; are data driven and involve data manipulation; and have high error rates. Governance that includes process documentation and audit trails for decisions made are essential to ensure bots are not performing unnecessary or redundant functions
- *Privacy:* There needs to be adequate privacy and security protections built into the applications. Having RPA that respects the confidentiality of information and maintains the security of data compilation is of high priority. The RPA must operate within the standing privacy policies to ensure it maintains the privacy of personal information.
- *Job Losses:* Americans generally hold positive attitudes about technology innovation, although they worry about the impact on jobs and what automation will mean for future skill requirements. A number of people worry about job losses stemming from automation and understand the need to upgrade their job skills. Given employee concerns regarding possible job losses and the need for upskilling, it is crucial that agency executives provide options for professional development and gaining the new skills required for emerging technologies. It is vital that employers improve the ways for workers to engage in lifelong learning.

CONCLUSION

Advances in process automation and AI are giving government agencies new capabilities to identify system bottlenecks and streamline business and operations processes in ways that can improve business and mission outcomes. Federal legislation has paved the way for municipal governments to affordably go digital. Since digital transformation is inevitable for businesses and local governments around the world, you have the opportunity to reap the benefits of this government modernization. Federal and state government workers are beginning to benefit from a growing army of digital robots designed to streamline agency workloads and quicken the delivery of public services.

Robotic process automation refers to software or processes that enable the automation of routine administrative tasks. RPA technologies emulate human actions and dramatically reduce an organization's low-value workload, freeing up employee time for higher-value work. With RPA, your local government can leverage software that automates government functions across your municipality. Robotic process automation (RPA) is the future of local government, with the power to eliminate thousands of man hours a year of manual data entry, and reduce your municipality's expenses drastically. More information about robotic process automation in government can be found in the books [14-16].

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Figure 1 Symbol of RPA [3].

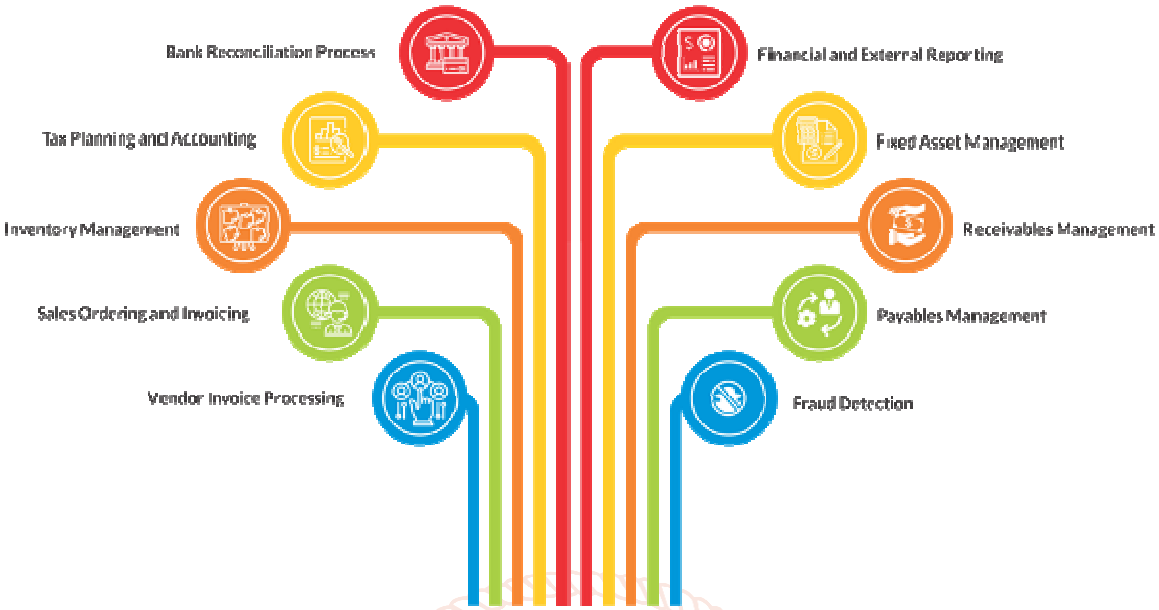

Figure 2 Processes that RPA can automate [4].

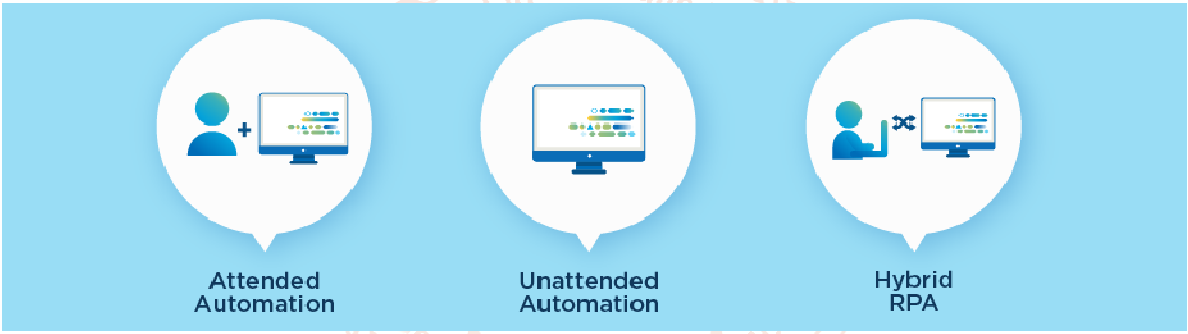

Figure 3 Three key categories of RPA [5].

Figure 4 Some tasks RPA can perform [5].

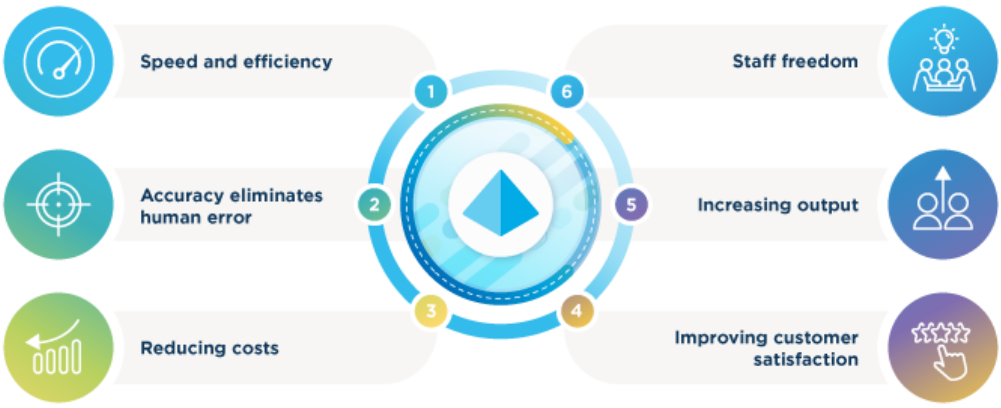

Figure 5 Some benefits of RPA [5].