The Promise of Robotic Process Automation for the Public Sector

A Research Paper from the Robotic Process Automation (RPA) Initiative at the Center for Business Civic Engagement – George Mason University (cbce.gmu.edu)

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Introduction

The purpose of this paper is to explain to non-IT readers the promise of Robotic Process Automation (RPA), a relatively new software technology used for automating high volume and mundane business processes and the practical impact of its implementation throughout public sector organizations. Examples abound of the technology being used at the global, federal, state and local levels. This research was done to give readers ideas for RPA implementation and to demonstrate practical benefits. It is by no means a comprehensive list. Rather, it is meant to spark the idea of "what is possible" for the public sector to be more effective and efficient, to be good stewards of citizen resources and to meet their growing expectations of public sector services, especially in the aftermath of the COVID-19 pandemic. **It is designed to meet the mission of The RPA Initiative:**

> **"** The mission of the RPA Initiative is to research, educate, and communicate how the adoption of technologies can improve productivity, operations and service delivery of public sector organizations. The Initiative will also study and recommend possible governance models and public policy initiatives for RPA deployment in the context of the broader economic outlook and the future of work. As part of its mission, the RPA initiative will take a multi-disciplinary approach to provide points of view on how RPA can help tackle both traditional and novel challenges of the public sector. **"**

Through dialog, research, education, and communication, this paper hopes to raise awareness and guidance to public sector organizations and policymakers. The public sector also needs some fresh initiatives to drive up public confidence and trust, so that RPA use can be positive and rewarding.

Both the private and public sector have moved towards incorporating RPA with Artificial Intelligence (AI) and Machine Learning (ML). It appears that the combination will make an already robust platform, which is a commercial software product engaging multiple stakeholders and capabilities, even more valuable. It also means that the robust power of the platform allows the technology to work on public service mission hurdles. Some of societies greatest challenges no longer seem insurmountable. The paper contains both links and a list of references used in its production. We have reviewed the paper carefully and diligently as academics. We apologize for any omissions and errors and hope you will contact the Center so they can be corrected.

The Promise of Robotic Process Automation (RPA)

HISTORICAL BACKGROUND

The use of automation and digital technologies for the production of goods and services and the subsequent advance of the quality of life for humans has always been a point of contention among policymakers. Governments have started to look at digital transformation efforts for some time now. Currently, there is a worldwide movement towards digitalization of all institutions.

It is a good place to start the conversation of how and to what extent Robotic Process Automation (RPA) parallels previous technologies and what promise it offers.

Carl Frey, in his widely acclaimed book, *The Technology Trap: Capital, Labor and Power in the Age of Automation, (2019),* traces today's automation era which started with the computer revolution in the 1980s, resembling the beginnings of Industrialization of the eighteenth century in England when the mechanized factory substituted the artisans' work, resulting in greater production and lower cost for the consumer. The onset of mechanization sustained economic growth reaching its peak by 1870. The British Industrial Revolution is still regarded by many as one of the most significant events in human history.

The First Industrial Revolution was not without criticism. As you can imagine, labor-replacing technologies were generally opposed and feared because of their angst as a disruptive force. They were especially resisted by those that had a monopolistic claim on exclusive production practices since they wanted to protect themselves from competition.

America led the next wave of what could be called The Second Industrial Revolution. It was dramatically different than the first one in England. It was not a revolution that primarily substituted machines for labor. Rather, this era of inventions saw machines complementary of labor, as they would rely on each other's strengths to create greater economic results. Americans benefited from economic progress, including better wages, increased health outcomes, and more educational opportunities.

Some argue that a Third Industrial Revolution has taken place, focused on the advancement

> Currently, there is a worldwide movement towards digitalization of all institutions.

of microprocessors and the introduction and pervasive use of computers. Widespread adoption has forced economists to rethink traditional concepts and move beyond constrained thinking.

While it is certain that some labor was displaced by computer programs and related technologies, nevertheless, it has dramatically increased labor needs to take full advantage of human reasoning and maximizing where computer processing power should be unleashed. As we all have experienced, computers have dramatically altered society, changed communication, impacted the private and public sectors, and created jobs and responsibilities for work never even imagined.

For the massive economic return to human society, it really didn't start that long ago. The first electronic computer, called the Electronic Numerical Integrator and Calculator (ENIAC), was invented in 1946; some might say it became a symbol of the computer revolution.

During the 1950s and 1960s, computers' size and cost prevented them from large-scale adoption. But then the personal computers were released, allowing greater widespread use.

During this acceptance, since the 1980s, many work-routine tasks have been transferred to computer-enabled machines and mundane, routine-based jobs started to decline. The computer revolution focused on productivity improvements on individual tasks such as word processing and manufacturing operations control.

One of the applications used was automation. 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. And computers expanded the set of tasks that they are able to perform. Experts argue correctly that its penetration into society will fundamentally alter the nature of work America has inherited since early Industrialization.

There is a difference between the scope and the pace of automation. The scope in part depends on workers using automation software, discovering what in the workplace can be modified. The pace depends on non-technological external variables and barriers to adoption, including regulations, consumer preferences and worker reluctance among others.

One example, from Martin Ford's, "Rise of the Robots" book (2015), estimated that attorney bill records are automatable and will make available 13% of attorneys' time for other projects or

> Widespread adoption of automation has forced economists to rethink traditional concepts and move beyond constrained thinking.

interests. Most often mentioned job position alterations are bank tellers and business secretaries. One study cited that 70% of tasks from industries such as office administration, production, transportation and food preparation will reflect automatability.

Much discussion has centered on macro-economic coordination of the automation transition. Some experts suggest a few policies to fill the gaps as we move toward a more automated economy. **According to The Economist Intelligence Unit, the Automation Readiness Index (ARI)—regularly determines which countries are better positioned to take up the policy challenges that automation poses focusing on three topics:**

Innovation policies

Government can facilitate greater adoption of automation focusing on policies that include support for visas, cutting the red tape to start a business and possible start-up support to name just a few.

Education policies

Big picture thinking skills coupled with strategic planning for educational change and execution skills among governments, businesses and educators.

Labor Market policies

Retraining and emphasis on skills needed to bring more workers into the automation sector and the promotion of lifelong learning.

The main benefits from automation will continue to grow and history has already demonstrated:

- Sustained productivity growth.
- Reduced human error - it is used to automate routine tasks such as copying, pasting, opening applications, sending emails and more.
- Worked in the cloud or with legacy systems.
- Has infinite scaling ability.
- Enabled fast and accurate processing.
- Self-developed and implemented easily.
- Improved reliability of processes and output.
- Enhanced customer experience.
- Increased revenue.

An unattended benefit one research survey by The Economist Intelligence Unit illustrated is that nine in ten respondents claimed that automation has kickstarted digital transformation in their organizations and its forward economic progress. As automation continues to mature, difficult challenges in automating business processes will be overcome. **Those challenges are:**

- Data privacy and security concerns.
- Deployment at scale.
- Lack of relevant personal talent and skills.
- Employee resistance.

The Rise of RPA

One of the latest labor-enhancing technologies, Robotic Process Automation (RPA) came out of the automation movement. It is defined by Digital.gov as a "low- to no-code (i.e., easy to use) Commercial Off the Shelf (COTS) technology that can automate repetitive, rules-based tasks. Like an Excel macro operating within a spreadsheet, RPA can emulate actions performed across a personal computer, access systems, and carry out specific tasks for human users."

"Digital assistant", "Robot" or "Bot", which is the short for robot, are unconventional terms used by the RPA community for automations. Each "Bot" is unique and can do one or multiple automation processes.

Popular uses of RPA include data entry, data reconciliation, spreadsheet manipulation, systems integration, automated data reporting, analytics, and customer outreach and communications.

> Each "Bot" is unique and can do one or multiple automation processes.

Operations, information technology (IT), and finance are the top three functions where process automation has been used. It is really the most obvious for automation, aka "low hanging fruit". But its successful use has allowed automation to expand into other functional areas. The Virginia-based William & Mary public university's business school has used RPA in its operations to ensure that their students continued to remain engaged with the institution following the shift to remote classes. With prior consent, they accessed every student's activity within the education platform used by the school in the previous week into another visualization platform, enabling the school to identify which students were disengaged and follow up with them to check for their safety.

RPA products vary in their exact capabilities, but all RPA technologies emulate human actions, enabling process owners or staff with appropriate training to rapidly design, test, and deploy automations dramatically, reducing an organization's low-value workload.

The RPA term itself originates within the last twenty years. Technology historians continue to debate whether it is a continuation of technologies earlier developed (screen scraping software, workflow automation software and management tools, and artificial intelligence) or it is a new technology by definition? The important point in this controversy is that RPA draws from an improved, refined and combined aspects of these technologies and elevates them to the next level. It also relies more on "drag and drop" features than on coding skills.

For RPA, legacy systems are no longer a constraint to interoperability. Using either the user interface (UI) or the Application Programming Interface

(API) capability, RPA platforms can automate old IT systems and streamline workflows that are employing existing infrastructure. Additionally, it can extrapolate data from these systems and move them to the cloud and contribute to the organization's modernization efforts.

What makes RPA user friendly is its steps of implementation which give non-IT personnel exciting work satisfaction and spurs innovation:

1. **Identify** and assess what's automatable.

2. **Prioritize** opportunities.

3. **Design** the business process.

4. **Build** the software robot that will emulate the steps of the process.

5. **Implementation.**

6. **Maintenance** and monitoring of the application process.

The COVID-19 pandemic has accelerated RPA use, creating a new reality. Workers in large numbers shifted to teleworking and were required to interact with each other to creating more digitally enabled solutions to business and societal challenges. External factors such as lockdowns, social distancing and other COVID-19 government restrictions prompted time to become more scarce than usual, both the private and public sectors had to manage uncertainty and risk, while facing serious constraints, including:

- Supply chain management.
- Surge in remote work.
- Budget and cost restraints.
- Revenue generation.
- Backlogs in public demand for goods and services.
- Innovate and adapt solutions to better serve employees and customers.

In this context, RPA gained even greater traction and became a baseline solution which is now embedded in institutions' "modus operandi". For example, the U.S. Department of Agriculture has developed a RPA Service Management Office (SMO) for automations to be used agencywide. It is permanently in the "toolbox," expanding beyond back-office functions applications to more mission related tasks.

The speed of delivery has become a more significant competitive advantage for organizations of all varieties because people are more digitally connected and enabled than ever before. Moreover, they have become used to accessing and receiving services in multiple places due to the latest advances of the information and communication technologies. The growth of 5G technology will further elevate this connectivity and revolutionize industries throughout the country and the world.

The growing interconnectedness of RPA with Artificial Intelligence (AI) and Machine Learning (ML) has created the latest software-based automation concept and trend of Intelligent Automation (IA). IA's power of connecting capabilities only makes the future of the technologies even brighter to solve many issues plaguing society.

Growing Use in the Public Sector

The history of RPA adoption really wasn't in the halls of public sector's IT. One could point to 2017 when Presidential Administration priorities were to make government more efficient and effective by reducing burdensome and low value tasks. It resulted in the release of the President's Management Agenda (PMA) which established the Cross Agency Priority (CAP) Goal 6 on Shifting from Low to High Value work. The Office of Management and Budget (OMB) policy then indicated RPA as a strategy to achieve CAP Goal 6.

The first phase of shifting from low to high value work started with the OMB Memoranda M-17-26 (June 15, 2017) Reducing burden for federal agencies by rescinding and modifying OMB Memoranda, by identifying and rolling back low-value, duplicative, and obsolete activities. The OMB Memoranda M-18-23 (August 27, 2018), perceived RPA as a strategy to achieve President's Management Agenda Cross Agency Priority (CAP) Goal 6 on Shifting from Low to High Value Work. Eight months later the OMB issued M-19-17 Memoranda on the subject "Enabling Mission Delivery through Improved Identity, Credential, and Access Management." This directive built on earlier work, calling for the security of an RPA robot to be as important as the security of a government employee.

The visibility of RPA officially permeated to lower levels of the administration influencers, including the CIO Council's Innovation Committee in 2019 which produced a white paper titled "Robotic Process Automation in Federal Agencies" providing a strategic examination of RPA for Chief Information Officers (CIOs) and technology leaders across the public sector. The white paper looked at how RPA can be used in accordance with the administration's priorities and began identifying areas where RPA can be utilized to be more valuable.

The Information Technology Modernization Centers of Excellence Act is a law enacted in December 2020 that supports business process and IT modernization at public sector agencies under the General Services Administration (GSA)'s leadership and in a cross-agency collaboration framework.

The first RPA program in the public sector space was established in April 2017 by the National Shared Service Center (NSSC) at National Aeronautics and Space Administration (NASA). **Highlights of the NASA program include:**

- Expanded agency wide.
- Offered advanced process improvement capabilities.
- Transitioned from on-premise enterprise platform to a cloud-based platform.
- The program has shifted from attended to unattended automations to maximum efficiency.
- Facilitated an early stage of Intelligent Automation (IA).

According to the Digital.gov RPA Use Case Inventory, **NASA's automations are mainly used across the following business functions:**

- Acquisitions.
- Administrative services.
- Finances.
- Human resources.

The General Services Administration (GSA) Office of the Chief Financial Officer is another pioneer of RPA in the public sector. The GSA was even more aggressive in its RPA execution. Highlights include:

- Developing the first government wide automations to be used.

- First program to offer Full Time Employees (FTEs) to be responsible for RPA operations.

- Created 6 internal RPA developers and produced +200K hours of yearly capacity.

- Offers advanced process improvement capabilities to redesign processes and accomplish business goals.

- Deployed 80+ automations across the agency, with +3,000 hours average in labor savings per bot.

For example, one of the most impactful bots created at GSA has been a Public Buildings Service (PBS) leasing robot. PBS manages leases for the federal government in 11 regions nationwide and processes at least $6 billion in payments per year. The assistant commissioner at GSA contacted the Office of CFO and together developed and automated a standardized process.

Automating credit card processing is another example of GSA saving time with RPA. It also created an auditable trail to improve compliance with federal law and congressional requests for information.

"Before we automated, they had to aggregate all the credit card purchases, put them into a spreadsheet, make sure it's all approved," said James Gregory, RPA Program Director at GSA. "We automated that end to end, from aggregating the orders and processing them and putting them in the systems for approval."

Gregory said the agency also added a logging function that creates a log of all the transactions, which benefits the auditing process. "With that process, prior to that, there were a lot of resources dedicated to addressing that," he said. Because employees now spend far less time on

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credit card transactions and processing, they can dedicate more time to customer service. According to the Digital.gov RPA Use Case Inventory, **GSA's automations are mainly used across the following business functions**:

- Acquisitions.
- Administrative services.
- Finance.
- Human resources.
- Mission assurance.
- Strategic communications.

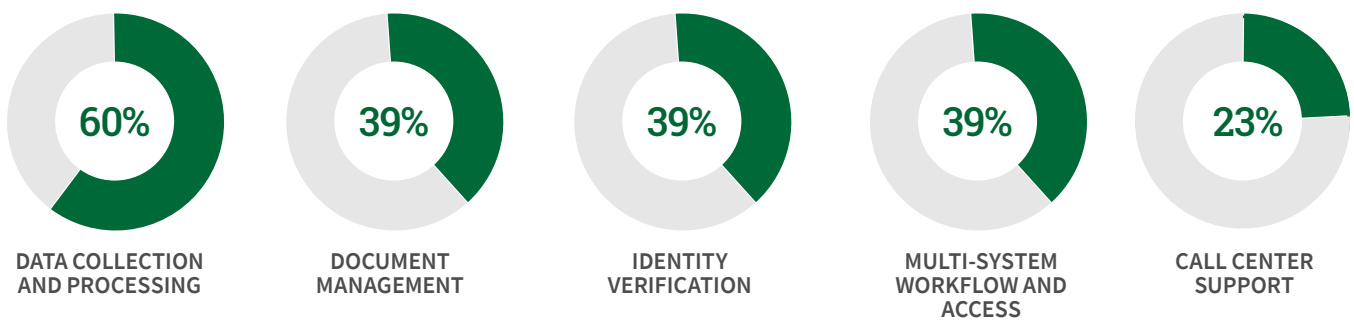The Defense Logistics Agency (DLA) at the Department of Defense (DoD) is another example of RPA use and success in federal government. The DLA program started in 2018, and as of March 2021 amounted a total of 111 automations, including 92 unattended bots. According

fedtechmagazine.com article, RPA helped DLA with increased activities and transactions processing: data reconciliation, updating sales orders and invoices, compliance, data extraction and audit support. In the future, DLA is looking to increase the complexity of automations harnessing workflow improvements, develop and invest in their own federated model that will allow them to create and fund their automations on their own timelines. Moreover, RPA in conjunction with AI is already being used at the Pentagon.

Digital.gov in their RPA Use Case Inventory reports that DLA automations were mainly used across the following business functions:

- Acquisitions.
- Finances.
- IT.

Across the public sector, a survey report of 167 Federal and State agencies as well as government contractors indicated that **the most common applications or use cases for agencies currently using RPA are:**

60%	39%	39%	39%	23%
DATA COLLECTION AND PROCESSING	DOCUMENT MANAGEMENT	IDENTITY VERIFICATION	MULTI-SYSTEM WORKFLOW AND ACCESS	CALL CENTER SUPPORT

Successful use cases continue to emerge as more agencies expand their use of RPA demonstrating the wide variety of issues that can be addressed.

Successful use cases continue to emerge as more agencies expand their use of RPA demonstrating the wide variety of issues that can be addressed. The American Council for Technology – Industry Advisory Council (ACT-IAC) gave a variety of RPA uses in "RPA in Federal Agencies: How Federal Agencies Achieve More Through Robotic Process Automation":

- **Workload reduction** and improved customer service at GSA.

- Dramatic **reduction of processing time** at National Science Foundation (NSF).

- **Improved processes** and workforce satisfaction at Internal Revenue Service (IRS).

- **Rapid process evolution** at National Institute of Health (NIH).

- **Improved return on investment** at the Office of Financial Innovation and Transformation – Bureau of Fiscal Service at Department of Treasury.

As RPA expands its use and scope across the federal government, the RPA Community of Practice (CoP) released in January 2020, The RPA Playbook. The document provided detailed guidance and set of strategies about the implementation and maturity of automations. It outlined multiple RPA use cases which are agency specific or can be applied throughout government. **According to the Playbook, there are 6 basic themes for proof of concepts/pilots with RPA programs:**

- getting started.
- ensuring collaboration.
- establishing goals.
- investing in process and improvement.
- balancing governance and productivity.
- thinking strategically.

The Playbook emphasizes that RPA is a good, low-cost tool with a quick impact that can reduce workload burden and allow focus on greater value endeavors. Use of RPA tools also provides the unexpected benefits of building interdepartmental and cross-agency relationships as well as producing capacity for the organization. That does not mean that there are no challenges with the adoption of RPA in the public sector. They are, but they appear both insignificant and surmountable. **A Fedscoop survey surrounding barriers to implementation reveal almost universal concerns:**

- Security /credentialing (41%).
- Lack of training (37% of respondents).
- Unsure where and what processes to automate (34%) and workforce displacement (26%).
- RPA not part of the fiscal year budget (26%).
- Lack of agency leader sponsorship (24%).
- Lack of ability to measure results (23%), and
- Don't see the value of RPA (14%).

Many public sector organizations can leverage RPA implementation to offset an aging and retiring workforce, as well as facing stagnant or decreasing budgets.

These concerns are often identified when change occurs in an organization, whether the organization is in the private or public sector. All are being overcome as RPA is permeating through the economy and will vanish as there are more universal use cases.

State and local governments have accelerated consideration of RPA as a tool to automate digital transactions, especially during the COVID-19 pandemic, allowing them to modernize, transitioning traditional services. These have included streamlining auditing processes, reporting incidents, managing contracts, and reducing fraud in tax and benefits systems. Statescoop reports the pace of RPA is gaining momentum at the state level, 44% of respondents said they began using RPA in the last 12 months. Moreover, industry experts estimate that 25% of states are using RPA currently.

Online statetechmagazine.com outlined in Fact or Fallacy : RPA Can Boost Agencies Quickly and Inexpensively, **new tools state and local government agencies can obtain using RPA, including:**

- Automated workflows to better deliver citizen services.
- Significantly reduced low-value workloads with RPA.
- Cost savings versus business process outsourcing, which is more expensive.
- Whole IT redesign is no longer necessary due to RPA's ability to integrate with legacy systems.

For example, Clark Partridge, the state comptroller for Arizona, talked about how RPA is very suited for state government because of high-volume and repetitive processes which are routine. "[the] Arizona's comptroller's office uses RPA to make routine updates in the accounting system, such as name changes, which are updated from the state's human resources and payroll systems. It performs these updates just like that individual would, and you have accountability for the RPA bot just like you would have for any employee. This process is fairly simplistic, which is why it was chosen for our pilot, but it demonstrates the capability. This saves our staff about 30 to 60 minutes a day", with Partridge adding that preparing financial reconciliations can be a prime candidate for RPA. A Carahsoft blog made the case in that automations can vary based on the specific needs at state level.

Pascal Bornet, co-author of the recently released book, Intelligent Automation, welcomes readers to the world of "hyper automation," providing more than 500 use cases and an insight how RPA coupled with artificial intelligence and machine learning can tackle societal issues that have been difficult to address:

- Managing immigration.
- Promoting citizen safety and security.
- Managing stakeholder services and expectations.
- Improving education.
- Addressing climate change and ecology.
- Managing infrastructure.
- Simplifying tax collection and improving organizational staff morale.

As RPA technology continues to gain wider adoption and is linked with other technologies, there is no limit on the effectiveness it can be in solving public sector challenges and doing it in a more efficient solution. **Consider real conversations and practical solutions being undertaken on urgent issues:**

Cybersecurity:

Kristin Judge, CEO and Founder of the Cybercrime Support Network points out that cybercrime victims are the largest victim class in the U.S. and is growing exponentially with no one supporting them. Crowdstrike latest global threat report, points out that hacking efforts by both cybercriminals and state-sponsored groups grew in 2020 and are unlikely to let up in 2021. McAfee December 2020 report estimated global cybercrime financial losses for over $1 trillion in 2020, a 50% increase since 2018.

Healthcare:

Freeing up nurses to focus on patients rather than on data entry workload. In Suffolk County, New York, CIO Scott Mastellon turned to RPA to free up the county's nurses from spending time doing paperwork so they could spend more time caring for patients. The Long Island region was hit hard by COVID-19 at the onset of the pandemic, and health care workers had been overwhelmed by the amount of data entry required to log coronavirus cases before the tasks became automated.

Combatting fraud, waste and abuse:

Bornet et all revealed that financial fraud has doubled in the last decade and in 2018 amounted for $5 trillion globally. Njtechweekly.com reported in April that "according to CIO Insight U.S., businesses waste $1.8 trillion annually. Yes, $1.8 trillion on mundane tasks that could be easily automated." An IBM study shows that "poor data quality costs the U.S. economy $3.1 trillion a year." Imagine the economic cost if both private and public sectors were totaled.

Environmental improvement:

RPA is already contributing to environmentally friendly and building healthier community initiatives. For example, a local agency in Czech Republic accelerated the application process for green boiler grants resulting in improved air pollution for almost 2 million residents. The Minnesota Pollution Control Agency collects real-time weather data and with the help of automation and AI converts it into an analytics program that produces air quality forecasts and alerts when necessary for citizens with respiratory issues. Other practices being enacted include combining satellite data collection and analysis for the monitoring of shipping or tropical storms prediction.

Citizen services delivery:

Intelligent chatbots have automated the public's demand for information that wasn't accessible via remote work for government employees. During the COVID-19 pandemic, RPA has expedited the applications for emergency loans and stimulus checks that were distributed to Americans. In Palm Beach County, Florida, the Clerk of the Circuit Court and Comptroller considered automation as a solution for its shrinking budget resources and workload increase. The operations and IT teams automated the process of tens of thousands of case documents submitted by attorneys via the Florida State's e-filling portal. Next, coupling RPA with AI and Optical Cognitive Recognition (OCR) technologies, close to one third of the e-fillings processed via the portal were automated and clerks solved more costumer-facing issues.

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Automation technologies have risen to meet and in many cases to exceed expectations improving the resilience of governments during the coronavirus crisis. Additionally, while economies were falling, it has demonstrated its potential and reliability during urgent times, evidencing the need for more RPA in order to support the economic recovery, the transition to the digital economy and to increase government resilience.

RPA adoption is accelerating not only in the U.S. but around the globe. As it is linked with other technologies such as AI and ML, it provides tremendous hope for mankind to rid excess of challenging public policy that have plagued the world. It is vital that the public sector accelerate

RPA adoption, generate even more use cases, and further accelerate the wealth of ingenious RPA solutions.

Technological progress has been the underlying factor of economic and social change over the past two hundred years. Prior to the COVID-19 outbreak, the adoption of digital technologies were already seen as key in driving economic and social value. But in the pressing post-COVID-19 transformational work and digital reality, RPA's potential is multifaceted: from prompting productivity and economic ascent, efficiency and employee experience to better public services, improved quality of life, smarter government spending, and resilience.

The recent changes to the Technology Modernization Fund (TMF) by the U.S. Congress is a significant opportunity for agencies to accelerate the adoption of automation. Congress increased the TMF fund to $1 billion, which would not be substantial if not for a change in the Fund's administration. In previous years the Fund was essentially a loan to agencies against future budgets. TMF was underutilized.

The OMB change allows the TMF determination board to now include grants to agencies. Agencies may only have to pay back the administrative cost of the TMF funds they get; they now have the option to make a 25, 50, or 75 percent repayment or the entire amount. Agencies will have no difficulty making the business case for partial reimbursement of their RPA and automation programs. TMF can accelerate RPA use and consequently scale automation across the public sector. We can expect that TMF changes will increase institutional capacity, deliver better services to underserved communities, liberate the workforce to focus on higher-valued tasks and finally realize technology promises to provide superior quality services to citizens.

TMF can accelerate RPA use and consequently scale automation across the public sector.

Implications for the Future of Work

How will the pervasive use of RPA in the public sector impact public employees and what does it mean for their work in the future? The answer appears bright for workers, but there will no doubt be some minor bumps during the transitionary period.

The pandemic has reshaped the work of almost every working individual. Many have had to adjust, and many have actually benefitted from the change in practice. Successful RPA implementation does require a workforce readiness and avenues of meaningful employment.

Even without an exponential increase in RPA use, workers have to upskill and improve their technological literacy and skills as the pandemic favored both private and public sectors that invested in digitalization and technologies access. Pew Research Center revealed for example, workers in nearly all professions have to now know how to use and interact with computers, screens or systems. This was already occurring before the pandemic but has dramatically escalated since the need for training and upskilling for millions of people across all ages, races, gender or geographical locations.

The public sector, in particular, can hasten this through adaptive training and guidance programs. Many public sector organizations can leverage RPA implementation to offset an aging and retiring workforce, as well as facing stagnant or decreasing budgets. RPA can be a solution because it prevents knowledge loss when employees retire, so the knowledge does not leave with them. A KPMG report argues the average age of public sector employees is 46 compared to 42 in the private sector, and there are twice as much as government employees over the age of 60 that they are under 30.

The RPA technology does give workers several benefits they do not currently exercise, including:

- Freeing workers from tedious and repetitive tasks.

- Reducing workload.

- Upgrading workers skills.

- Allowing employees to engage more with citizens.

- Helping workers to perform more creative, empathetic and humane jobs.

- Reducing stress which can lessen employees from being tired and "burned out."

- Assisting workers to be an essential part of the digital transformation journey.

Moreover, current experience in RPA implementation provides workers with opportunities for employment and promising careers. The 2020 LinkedIn report on emerging jobs listed the robotics engineer role as the number 2 in ranking. Recently, one RPA program specialist job position at the Office of the Chief Financial Officer at GSA was posted at GS 14 pay grade and paying between $122,530 to $159,286.
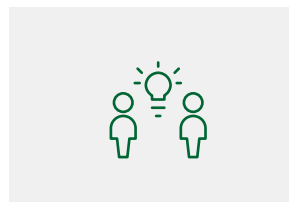
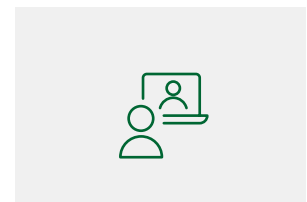## Some of the RPA professional benefits witnessed, involve:

| Career opportunities are flourishing. | Jobs are well compensated. | Employment positions don't necessarily require a college degree. | RPA activities are remote-work friendly. |

RPA implementation also seems to lead to more empowered workers and improved personal relationships. In March 2021, ACT-IAC reported that two automations at the NSF increased employee morale and provided time for employees to perform more analytical work, improving their technical and professional skills. Furthermore, the Community of Practice reports that RPA has helped building interdepartmental and cross-agency relationships as well as producing capacity for organizations. RPA promises to expand work opportunities and to make existing jobs easier and faster. It will shift employment over the long term from mundane and low-value employment to higher value positions offering a host of worker benefits, especially improved working conditions and greater involvement in outcomes.

Use of RPA tools also provides the unexpected benefits of building interdepartmental and cross-agency relationships as well as producing capacity for the organization.

Global RPA Expansion

RPA use and implementation continues to build not only in the U.S., but also around the globe. There is a transition trend toward "digital government" and consideration for new technologies adoption at scale, including RPA. Noted use cases include a city government in Japan that used RPA to reduce staff workload, improve service delivery to citizens and resolved the challenges of new staff hiring and orientation.

Examples abound. In the United Kingdom (UK), one of the largest government department agencies has automated routine tasks, increased efficiency and improved decision making. 12 RPA bots processed an average of 2,500 claims per week clearing a backlog of over 30,000 claims in two weeks with a calculated return on investment of 15 to 1. 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. The automations were in charge of downloading the lab results providing with 80% reduction of the manual workload, reduced human errors and enabled rapid analysis and interpretations of COVID-19 results. Consequently, nurses saved 3 hours per day of administrative work and focused their energy and time on caring for their patients.

A New Zealand-based higher education institution started automating internal processes such as student transcript requests and moved to an academic course option around RPA. With RPA, the university has improved students' experience, eliminated workload for staff members and provided additional time to focus on human-centric services.

The Norwegian postal service is using RPA bots for last mile mail delivery, while the German national postal service introduced RPA bots to free up worker time and help them on the ground. Belgium is using RPA bots for job matching employment opportunities, focusing on workers competencies instead of just professional experience or education.

Another city government in Denmark has built automations for complementing their resource shortage and delivering better services to its growing population demands. In Sweden, a local department of welfare used RPA to speed up their welfare payment decisions and boost employees' morale.

The European Parliament has endorsed RPA driver of transformation in the public sector. The European Commission President addressing the European Parliament declared "we will automate work that is wearisome for us humans:

> The European Parliament has endorsed RPA driver of transformation in the public sector.

carrying heavy loads, performing repetitive tasks in factories or in offices" and "this will give us time for what computers can't do: empathy and creativity."

The European Commission's Joint Research Centre noted that RPA is defined as a mature technology, which is sufficiently developed, resilient, scalable and reliable to be used in large government organizations.

Part of this emphasis for global adoption may be because of more sympathetic views of citizens toward automation. A 2019-2020 Pew Research Center Survey, demonstrated with survey data that citizen attitudes can help drive success of technology and that they are different across the globe. Asia is more optimistic or positive while the West is more pessimistic/negative about AI and Automation.

In Asian countries such as Singapore, South Korea, Taiwan and Japan over 60% of respondents favored AI and robotics adoption for the society, while in Western Europe, Canada and the U.S. less than half shared the same view. The research survey discovered that, besides India and Russia, highly educated people tended to favor AI and robotics.

Nations throughout the world are preparing for the future nature of work. We saw encouraging technological adoption at national level via tax incentives (Italy) or providing physical spaces for Research and Development (South Korea) as well as creating innovation ecosystems (UK, China), digital friendly regulations (Singapore, Denmark) and investing in technological and human talent (Finland, Sweden). At the center of this shift sits the education component, which is reconsidered, reformed and upgraded and countries such as Estonia, South Korea, Singapore and Finland are leading the way.

RPA is now ubiquitous across the globe. The good news is that the United States is the largest market for RPA, but its use can be accelerated. It will continue to provide a competitive edge in ensuring we have an effective and efficient public sector. That translates to a U.S. strategic advantage in automation, and the next level of technology, with AI and ML. The U.S. RPA use cases should build upon even more enthusiasm and momentum.

> The good news is that the United States is the largest market for RPA, but its use can be accelerated.

Recommendations

Budget — Ensure there are budget resources available to fully implement RPA technology across the public sector to prioritize effectiveness and efficiency.

Educate — Support investments to educate more public sector employees on the positive benefits of RPA on program activities and work duties.

Research — Research and inform public sector organizations on "best practices" for successful RPA implementation.

Prioritize — Prioritize training and education for students and workers to meet and fill the demand for RPA employment positions across the public sector.

Publicize — Publicize RPA implementations in the public sector, including impact on program activities, estimated labor hours saved, and return on investment so stakeholders can observe good stewardship.

Encourage — Encourage continued agency cross fertilization of RPA practices through increased engagement with and use of RPA Federal Community of Practice publications across the public sector.

Eliminate — Eliminate any restrictions on the use or implementation of RPA based on outdated regulations and policies while protecting security procedures.

Explore — Explore how public policy impacts RPA adoption and suggest any proposals for improvement.

Support — Support continued research and development of artificial intelligence, machine learning and RPA.

Continue — Continue to support the long-standing policy of government digitalization.

Works Cited

Carl Benedikt Frey, *The Technology Trap: Capital, Labor and Power in the Age of Automation, 2019,* Princeton University Press.

Robert Gordon, *The Rise and Fall of American Growth*, 2016, Princeton University Press.

Robert Putnam and Shaylyn Romney Garrett, *The Upswing: How America Came Together a Century Ago and How We Can Do It Again*, 2020, Simon & Schuster.

Martin Ford, *Rise of the Robots: Technology and the Threat of Jobless Future*, 2015, Basic Books.

Mark Muro, Robert Maxim and Jacob Whiton, *Automation and Artificial Intelligence: How Machines are Affecting People and Places*, January 24, 2019, Brookings Institution, brookings.edu.

The Economist Intelligence Unit, *Who is Ready for the Coming Age of Automation report*, 2018, automationreadiness.eiu.com.

The Economist Intelligence Unit, *The Advance of Automation: Business Hopes, Fears, and Realities*, 2019, automationfirst.economist.com.

Guide to Robotic Process Automation, *What is RPA?*, digital.gov.

Pascal Bornet, Ian Barkin and Jochen Wirtz, *Intelligent Automation: Welcome to the World of Hyperautomation*, 2020.

Office of Management and Budget, *Memorandum for Heads of Executive Departments and Agencies-Shifting from Low-Value to High-Value Work*, August 27, 2018, whitehouse.gov.

Office of Management and Budget, *Memorandum for Heads of Executive Departments and Agencies-Reducing Burden for Federal Agencies by Rescinding and Modifying OMB Memoranda,* June 15, 2017, whitehouse.gov.

Office of Management and Budget, *Memorandum for Heads of Executive Departments and Agencies-Enabling Mission Delivery through Improved Identity, Credential, and Access Management,* May 21, 2019, whitehouse.gov.

Chief Information Officers Council Innovation Committee, *Robotic Process Automation in Federal Agencies*, 2019, cio.gov.

Mark Rockwell, *New Law Enshrines Modernization Centers of Excellence Efforts*, December 4, 2020, fcw.com.

Guide to Robotic Process Automation, *RPA Use Case Inventory,* digital.gov.

Kate Macri, *GSA's RPA Success Story Provides a Template for Widespread Agency Adoption*, January 13, 2021, governmentciomedia.com.

The Robotic Process Automation Initiative at the Center for Business Civic Engagement, George Mason University, *Maximizing Operational Effectiveness and Efficiency Through Robotic Process Automation: The General Services Administration (GSA)'s Journey and Success*, April 22, 2021 Webinar, cbce.gmu.edu.

Phil Goldstein, *DLA Continues to Gain Efficiencies via RPA Technology*, March 24, 2021, fedtechmagazine.com.

The Robotic Process Automation Initiative at the Center for Business Civic Engagement, George Mason University, *RPA-Current Use and Future Strategies for the Department of Defense*, May 20, 2021 Webinar, cbce.gmu.edu.

Fedscoop and Statescoop, *RPA's Expanding Role in Government report*, December 2020, cdn.fedscoop.com.

The American Council for Technology – Industry Advisory Council (ACT-IAC), *RPA in Federal Agencies: How Federal Agencies Achieve More Through Robotic Process Automation*, March, 2021, actiac.org.

Guide to Robotic Process Automation, *RPA Community of Practice – RPA Playbook*, January, 2020, digital.gov.

Guide to Robotic Process Automation, *The State of Federal RPA report*, November 1, 2020, digital.gov.

Advanced Technology Academic Research Center (ATARC) webinar, *RPA in the State and Local Government*, May 5, 2021, https://www.youtube.com/watch?v=btI7-LCptKE.

Zeus Kerravala, *Fact or Fallacy: RPA Can Boost Agencies Quickly and Inexpensively*, February 17, 2021, statetechmagazine.com.

Phil Goldstein, *How Robotic Process Automation Helps State Government*, April 18, 2019, statetechmagazine.com.

Joel Cherkis and Sangeetha (Uma) Natarajan, *Federal and State Governments Scale and Succeed When They Formalize Their RPA Programs*, November 4, 2020, carahsoft.com.

Bradley Barth, *Cyber nonprofits ask billionaires to show them some love*, April 16, 2021, scmagazine.com.

Crowdstrike, *2021 Crowdstrike Global Threat Report*, February 22, 2021, crowdstrike.com.

McAfee Corp., *New McAfee Report Estimates Global Cybercrime Losses to Exceed $1 Trillion*, December 20, 2020, mcafee.com.

Esther Surden, *Jersey Shore Startups Documents The Birth Of A New Robotic Process Automation Startup*, April 14, 2021, njtechweekly.com.

Alan Joch, *State and Local IT Teams Use Real-Time Data to Boost Services*, January 29, 2018, statetechmagazine.com.

RPAToday, *AI+RPA= First-In-The-Nation Solution for Palm Beach County Clerk of the Circuit Clerk*, May 20, 2021, rpatoday.net.

McKinsey & Company, *A Government Blueprint to Adapt the Ecosystem to Automation and the Future of Work*, January 2020, mckinsey.com.

Angus Loten, *Banks Use Software Bots to Process Surge of Pandemic-Related Loans*, June 9, 2020, wsj.com.

Andrew Perrin and Sara Atske, *7% of Americans don't use the Internet. Who are they?*, April 2, 2021, pewresearch.org.

Health Services Executive, *Robotic Process Automation (RPA) Centre of Excellence (CoE): The Mater Hospital Case Study*, March 4, 2021, hse.ie.

Lorna Stark and Brenda Walker, *Modern Government: Connected. Powered. Trusted.*, February 2021, institutes.kpmg.us.

LinkedIn, *2020 Emerging Jobs Report*, 2020, business.linkedin.com.

General Services Administration Office of the Chief Financial Officer, *Program Specialist*, April 26, 2021, usajobs.gov.

UiPath, The Path to Digital Government: *How Automation Helps Governments Enhance Citizen Services and Improve Agency Productivity*, 2020, uipath.com.

Deloitte, *The Future of Work in Government: Navigating a Shifting Talent Landscape*, February 28, 2019, deloitte.com.

Courtney Johnson and Alex Tyson*, People globally offer mixed views of the impact of artificial intelligence, job automation on society,* December 15, 2020, pewresearch.org.