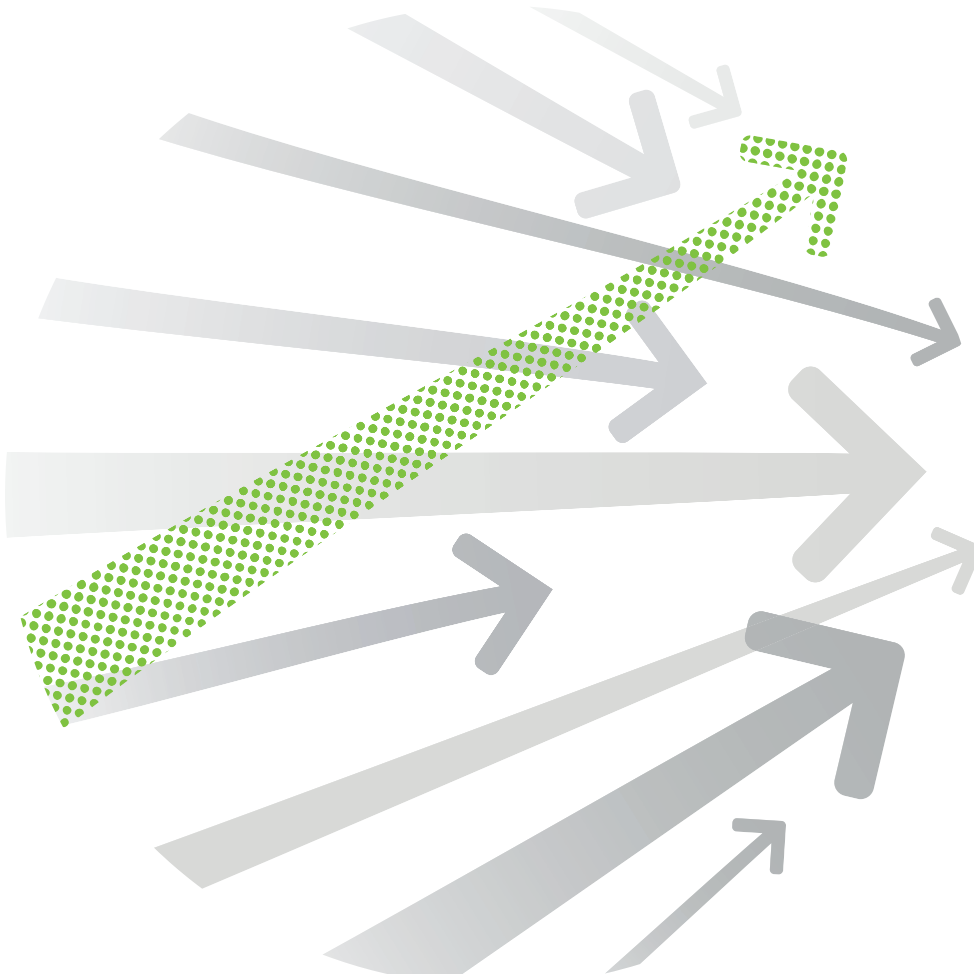

The Path Forward:
Operationalizing RPA to Automate the Digital Supply Network

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I. Introduction

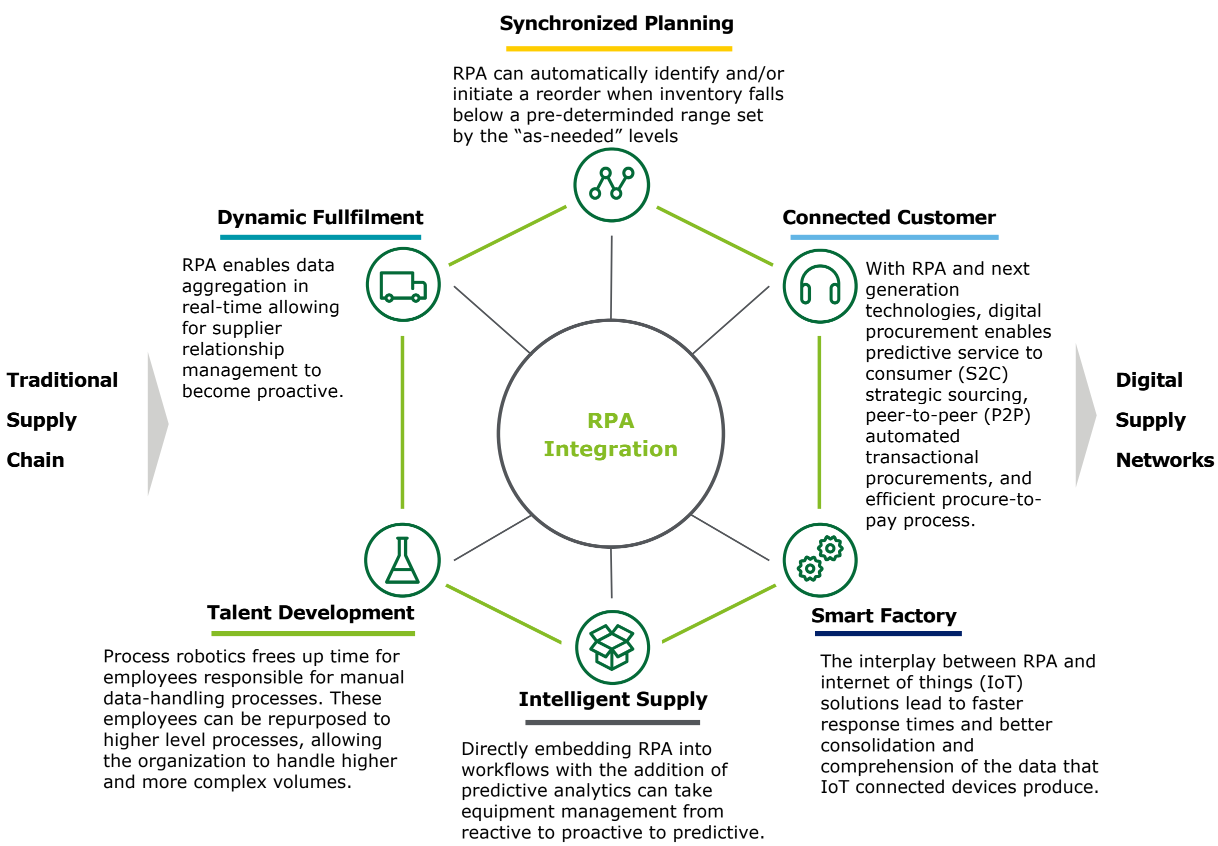
As organizations move away from traditional supply chains to more robust digital supply networks, it is imperative to embrace automation capabilities as crucial integrators bringing next-generation technologies (e.g. predictive sensors, machine learning, and artificial intelligence (AI)) together to drive the traditional supply chain practice into the digital age. Robotic Process Automation (RPA) is one technology widely embraced by industry. RPA software codes for bots that mimic the actions humans take to complete repetitive, rules-based computer processes in a fraction of the time. In relation to advanced cognitive technologies such as machine learning algorithms or AI platforms, RPA is more accessible to organizations as a fundamental first step of digital transformation. Bots play a critical role in digitizing all aspects of the value (supply) chain. The key is to uncover where the critical interfaces exist within an organization's supply chain enterprises and tactfully apply the power of process robotics to mitigate traditional "swivel chair" activities. These activities consume massive amounts of human time and effort which is better spent on higher priority tasks. Bots are also critical because they act to connect sub-systems within an enterprise by moving data from one application to another and eliminating data siloes.

Next-generation technologies are less impactful when used in a sequential manner or as individual components. Process robotics solutions, which utilize RPA software, allow for parallel processing of supply chain data, where RPA deployments compile data to enable the future, and logical application of AI capabilities on an ongoing basis. Those capabilities can then be applied to conduct ongoing and increasingly targeted, relevant and effective data analysis. The potential result is a wide range of new possibilities and enhanced business value: process cycle time reduction, operations scalability, increased accuracy due to the reduction of human error, and increased productivity. Furthermore, the creation of a digital workforce allows humans to focus on decision-centric tasks that require judgment.

As RPA software is embedded across the federal government, agencies are embracing bots as new 'digital personas' within their organizations. In the defense space, for example, the digital workforce is taking shape via 'digital soldiers' which act to automate transactional processes and allow soldiers more time to spend on mission-critical tasks. Across the federal government, digital personas work alongside their human counterparts saving them time and resources and elevating agencies' abilities to better pursue their missions.

II. RPA's Role Transforming the Traditional Supply Chain into a Digital Supply Network

Industry 4.0, the implementation of networked physical systems, is already here and starting to change how supply chain operations are defined. New capabilities available to industry, such as analytics and process automation, now allow for – and even encourage – the traditional steps (plan, source, make, deliver) to be both done simultaneously and provide real-time feedback. Digital labor intertwines the digital and physical networks, allowing for new connections between the various nodes of a supply chain (See Figure 1).



While the first applications of Industry 4.0 technologies were targeting operational efficiencies, supply chain leaders are now implementing new operational processes that best adapt to the evolving technological capabilities and higher-demand environments in which they operate. Federal agencies can and should leverage these new efficiencies and operating models to deliver more on time and on cost.

RPA Applications Advancing Traditional Supply Chain Nodes

RPA has reached a point of development and utility that is ready to move from solely back office processes to applications that are more complex. The core benefits of RPA include: efficient fulfillment, better customer value, increased network responsiveness and resiliency, higher accuracy and propelled financial success. To better connect and understand how supply chain processes can take advantage of RPA to achieve these objectives, we will explain how RPA enables migration from the traditional supply chain model to the interconnected, dynamic digital supply network centered on a digital core. RPA plays a role that can lead to better outcomes for each phase of the supply chain and also open the door to use of Industry 4.0 technologies throughout.

The **plan** phase involves demand and supply planning, balancing resources with requirements and developing an inventory strategy. When creating an inventory replenishment strategy, it is vital for an organization to know how much inventory they should hold on site. Too much inventory could lead to wasted money, but too little inventory could create a challenge for the network to respond to a sudden increase in need. Achieving a perfect state Just-In-Time (JIT) strategy, where demand matches supply exactly is becoming increasingly possible with the help of RPA. With historical data, future demand models, and predictive analytics, an organization can determine the best size of inventory to meet operational needs. Once the inventory strategy and requirements are determined, RPA can follow rules to identify and/or initiate a reorder when inventory falls below a pre-determined range. The move to synchronized planning will likely create more agile networks with intelligent supply.

The **source** phase typically involves material acquisition and payment handling. With RPA and next-generation technologies, digital procurement enables predictive service-to-consumer (S2C) strategic sourcing, peer-to-peer (P2P) automated transactional procurements, and efficient procure-to-pay process. P2P is highly transactional and currently requires a plethora of time and resources to complete. Here, RPA helps reduce the need for manual labor in repetitive processing, such as handling purchase orders, requesting goods/services, validating receipt of materials, and paying invoices. Additionally, RPA's ability to aggregate data in real-time allows for supplier relationship management (SRM) to become proactive. RPA can set the foundation to help organizations progress to more advanced, disruptive capabilities. For instance, machine learning can be adopted to improve sourcing insights and procure-to-pay process efficiency through studying historical and real-time data.

In the federal setting, the **make** phase can be associated with operational readiness: a network's responsiveness and resiliency. RPA can help with predictive maintenance and real-time asset monitoring. Through gathering real-time equipment performance data from Internet of Things (IoT) connected devices, supply chain owners can use analytical models to predict issues and optimize maintenance scheduling. RPA comes into play through consolidating data from the multiple systems and creating real-time asset monitoring dashboards. Across the federal space, mission-driven work is dependent on timely actions and specifically in the defense sector, mission readiness relies on updated, accessible data, and advanced digital capabilities. The interplay between RPA and IoT solutions could lead to faster response times, showing how RPA begins to move the supply chain from a linear to connected network and transforms the base into a smart base.

The **deliver** phase traditionally encompasses order fulfillment, logistics, order management, warehousing, and transportation. RPA can help with two specific aspects of delivery, namely order processing and transportation cost optimization. While the customer side of ordering processing is automated and user-friendly, the back-end is still manual. RPA can increase the speed of order processing through sending automated email replies once an order has been received, transferring the order information from front-end database to back-end database used by the people who fill the order. This solution can potentially free up the time of the employees who manually move the information and also help reduce back-end error. These employees can be repurposed to filling orders rather than processing them, allowing the organization to handle higher volume. Furthermore, the workforce can use the historical order data to build models to predict future demand, which circles back to synchronized planning. In regard to transportation optimization, RPA in combination with more advanced technologies can optimize an organization's workforce and equipment to help cut transportation cost. RPA can consolidate data from multiple enterprise applications that contain historical transportation information into one place. Once the data is merged, route optimization algorithms can use this information to increase the efficiency of delivery. Directly embedding RPA into workflows with the addition of predictive analytics and other advanced technologies transitions the supply chain from the simple deliver model to dynamic fulfillment.

Digital Soldiers in Action

An aircraft signals to a base that one of its parts is broken or nearing end-of-life. The bot or 'digital soldier' at the base checks the local inventory to see if they have the part on site. One of the following scenarios could occur:

a) The bot or 'digital soldier' tells the aircraft that the base has the part
b) The digital soldier informs the 3D printer on base to make the part
c) The digital soldier contacts the closest base to the aircraft's current location that has the part and capability to repair the aircraft
d) The digital soldier reorders the part to the aircraft's stationed base.

Any of these four scenarios would help ensure that the warfighter equipment would be repaired as soon as possible and the aircraft can get back in the air.

III. Convergence of RPA and Supply Chain in Action

Section II provided high-level examples of how RPA benefits a supply chain within the traditional framework, this section will focus on three specific case studies to show how RPA can help solve real problems within a supply chain.

RPA in Action - Three Digital Supply Network Scenarios

Inventory Management: By introducing RPA into the inventory management process, Schaffer, the inventory manager, is now able to focus his time on analyzing the use of inventory in real-time, whereas previously he spent hours manually consolidating data from multiple systems.

Procurement: With a much higher accuracy through RPA, not only will Christine and Allie, the contract writing clerks, be able to delegate the highly time-consuming tasks of uploading reporting data, they can now focus more of their time on strategic procurement initiatives such as drafting strategic sourcing criteria and negotiations by using RPA to scan similar requirements or expanding their small business programs by using RPA to automatically conduct market research via the Dynamic Small Business Search website.

Logistics and Distribution: By automatically processing millions of timed transactions through RPA, Ken, the requisitions order manager, can significantly drop level of effort required for quality reviews he would have to conduct in overseeing human labor as well as program his RPA bots to deliver on-demand reporting and tracking, enabling him to always be up-to-date and focus more of his time on leadership updates and fleet data analytics to look for more ways to improve his operations.

Inventory Management

Federal agencies spend a great deal of time and resources recording and auditing their mission activities. This applies in the Department of Defense (DoD) in instances where soldiers are redirected away from mission-critical operations and into administrative activities to meet compliance requirements. One such instance is the lateral transfer process for military equipment. Overall, the process is a paper-based accountability activity for the recordation of exchanging physical assets between responsible parties and occurs across every echelon of all DoD tactical organizations. To complete a lateral transfer, users are required to log in, verify the correct data elements, gather and enter relevant information, and then sometimes, ultimately process the physical exchange or relocation of the asset. The manual and highly transactional nature of this data entry task makes it a perfect candidate for RPA. Digital soldier bots can be applied on top of the existing SAP infrastructure to lessen the analytical burden on the responsible officers, allowing them to focus on mission support objectives that require critical thinking and judgment. Results from RPA implementation could potentially include improved quality assurance, reduction in processing time, and increased throughput. Furthermore, instead of always working a backlog, the lateral transfers could possibly be completed in close to real-time. As this capability is scaled, potential exists to embed machine learning capabilities as part of the process improvement for upstream and downstream enhancements impacted by bots. The direct impacts on unit readiness cannot be underestimated. The ability to have the right piece or sets of equipment available for the right user at the right time (especially during highly critical collective training periods) changes the training, and ultimately, overall readiness rating of that user and troop formation.

Procurement

On August 30, 1974, Congress enacted the Office of Federal Procurement Policy Act, which required the establishment of "a system for collecting, developing, and disseminating procurement data."[1] This led to the establishment of a centralized system called the Federal Procurement Data System – Next Generation (FPDS-NG) as the sole system to publicly collect and provide 52 key data points on every contractual action of every governmental agency. However, as detailed in two Congressional Research Service (CRS) Reports published in 2016[2] and 2013[3], FPDS-NG is still dealing with data quality challenges, continually frustrating stakeholders who support and use FPDS-NG. Many of these challenges stem from systemic errors, such as constant updates and changes to the Federal Acquisition Regulations (FAR) and FPDS-NG systems, as well as human errors from both specialists and reviewers. While a single FPDS-NG entry can be completed in minutes, multiplying these entries across millions of contract actions filled by thousands of specialists, officers, and reviewers can add up to numerous hours of skilled labor taking away from an understaffed core contracting mission.

RPA, as a rules-based software with a clear advantage in processing speed and accuracy, is ideally suited to relieve the manpower burden this process establishes, and meet or potentially exceed current FPDS-NG data quality. Furthermore, RPA helps enable rules-based compliance by directly translating entries from various contract writing systems, and rapidly responding and applying evolving congressional and FAR regulations by constantly referencing the most recent policies while conducting data entry duties. With higher accuracy, not only can GAO reports achieve greater confidence and detail to inform on various congressional strategic initiatives, such as consolidating requirements on strategic procurement, they can enable more accurate funding and acquisitions forecasting, as well as, true predictive analytics for future years.

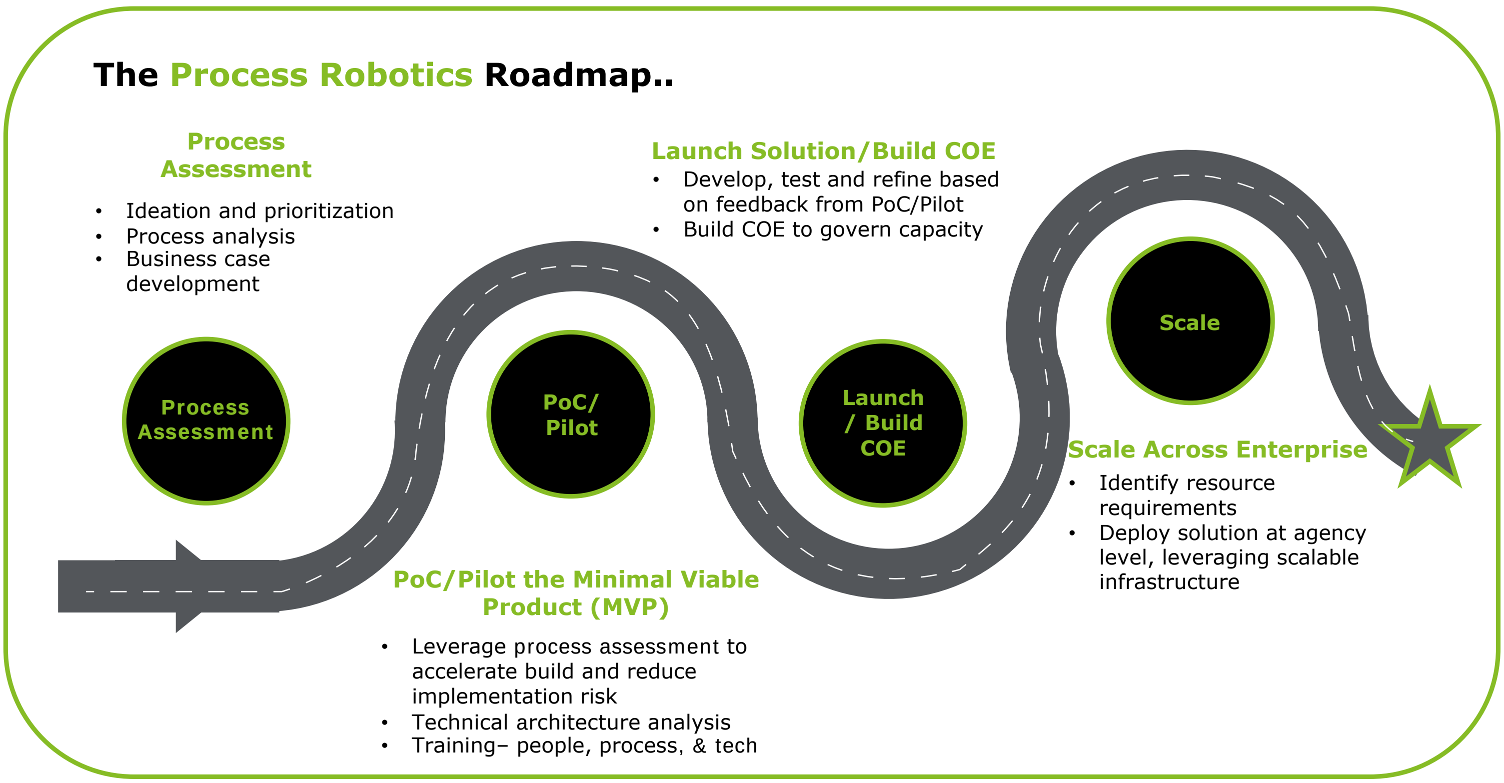
Logistics and Distribution

In every federal agency that employs a comprehensive suite of client-facing assets, such as equipment, vehicles, or security machines, a need exists to constantly employ a servicing supply chain to buy, maintain, repair, and recapitalize these assets. To maintain real-time awareness and control of these assets, many agencies apply structured requisitions to detail each logistics action. However, for many agencies, these requisitions lead to mountains of paperwork and digital transactions that are often restrained to legacy systems and processes. TSA is one of these agencies, with 14,000 scanning and security assets spread across 440 airports supported by a $1B acquisitions budget.[4] Despite all of these moving pieces, the process itself is predominantly paper-based and currently requires a dedicated office of 30+ Full Time Equivalents just to operate.

As this requisitions process is also well-structured and involves millions of transactions, it is an ideal process for automation. The advantages for a bot include not only improving the accuracy and timeliness of various transaction requests enabling a real-time 24/7 tracking capability, but it will also allow TSA to reallocate personnel and resources to proactively analyze deployment trends while informing key stakeholders via automated e-mail reports. Ultimately, this can help empower TSA to reach their strategic goal to achieve data-based decision-making capabilities via accurate agency-wide metrics.

IV. Implementing RPA at Federal Agencies

The introduction of RPA into supply chains triggers a cascade of benefits resulting both directly from the integration and indirectly from the capabilities it affords. With deep experience implementing process robotics solutions across the federal government, Deloitte has developed a methodology to accelerate digital transformation. Deloitte's process robotics approach follows three primary phases – advise, implement, and operate – to take organizations through the transformation from identifying key candidate processes to rapidly realizing the benefits from digital workers. Deloitte recognizes that each agency is unique and will require a tailored approach based on individual objectives. Deloitte tailors the approach through the Process Robotics Roadmap:



Deloitte has helped federal organizations embrace RPA by employing industry leading practices to help alleviate challenges such as bot repair and software updates. One such practice is establishing management and sustainment capabilities through an RPA sustainment model, dubbed a Center of Excellence (CoE), from the onset of integration. Since governance (the structure to manage and/or dictate who performs what tasks, when, and why, across a given ecosystem) and policy adherence play premier roles across the DoD, the implementation of an RPA CoE entrenches crucial governance and oversight to help ensure all RPA operations are aligned to enterprise strategy and policy as the capability scales. Some of the responsibilities of the RPA CoE include issuing policy, monitoring cost and effectiveness, and setting up protocols to initiate, approve, and communicate updates to the stakeholder community. By implementing RPA alongside a digital sustainment model, agencies can mitigate risk, manage existing technologies, and plan for further integration of digital technologies across their supply networks and future enterprise.

V. Conclusion

RPA is an essential intermediary accelerator and real-time processor that lays the foundation for a traditional supply chain to elevate to an integrated and parallel processing supply network. What was originally infrequent and tedious human processing, reviewing, and reporting between siloed supply chain nodes can now apply superhuman levels of frequency, accuracy, compliance, and tirelessness required for each supply node to not only connect with adjacent nodes, but all nodes in the supply chain. As these bots enable a new threshold of real-time responses and feedback loops, every stage of a supply chain can operate in concert, achieving a truly networked state. And with a supply network, not only can organizations achieve new efficiencies with their current chain, new capabilities are enabled such as dynamic fulfillment, connected customer operations, accurate enterprise-wide decision-making, simultaneity of supply chain activities, and predictive maintenance. Federal agencies implementing a supply network will likely be able to deliver the efficiencies and transparencies taxpayers already expect in an interconnected, digital world.

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