Robotic Process Automation

Definition of RPA Software

RPA tools are designed to mimic the same "manual" path taken through applications by a human using a combination of user interface (UI) interactions or by using connectors to client servers, mainframes or HTML code. An RPA tool operates by mapping a process in the RPA tool for the software "robot" to follow computer pathways between screens and various data repositories. An RPA tool can be triggered manually or automatically, move or populate data between prescribed locations, document audit trails, conduct calculations, perform actions, and trigger downstream activities.

Flavors of RPA Tools

There are various flavors of RPA tools, ranging from ones that operate on individual desktops and servers to ones that only operate on enterprise servers.

Most RPA tools will evolve over time to offer a variety of different functionalities and will add process-specific functionality. An RPA tool may be linked to other tools in the software vendor's product suite to add other functionality from machine learning, AI or process mining or add tools that provide employees guidance for the next-best action or training.

RPA use cases include working with structured digitalized data that needs rekeying between systems as well as consolidating, manipulating or interrogating notably in scenarios where organizations do not want to redevelop or replace applications. Opportunities to generate revenue through improved automation should be prioritized after the tools have been understood.

Flavors of RPA Tools Functionality

Many tools are coming to market under the banner of RPA, but actually almost none of the tools meet all the same criteria. These tools can have very similar functionality regardless of how they are actually deployed. Each RPA tool may have a slightly different approach to how it handles the following issues:

■ Attended or unattended automation capabilities — Some RPA tools work only unattended on a virtual machine and not on an employee's desktop. Other tools can be deployed to assist a worker in automating stages of a process on the worker's desktop.

■ Crafting the "instructions" for the bot to execute — Some RPA tools come with their own metalanguage with a graphical user interface or a process modeling tool to craft the "scripts." Some tools have a record button to make an initial pass at the typical path of a process. However, for some tools with the ability to create similar outcomes, coding knowledge is needed, such as C#, programming languages. Buying decisions need to consider the need for ease of scripting — the level of coding knowledge and the amount of IT programming and compiling needed to complete working scripts. Note that even if a tool claims it is easy for business people to use without IT, you need to be clear about where and how IT is involved (see "Robotic Process Automation: Eight Guidelines to Successful Results").

■ Bot process independence — Some RPA tools allow you to use the executable capability to sequentially have the capability to run multiple processes with one bot. Others tie the bot to only the specific process, which is a different style of proposition.

■ Some limited or no AI or machine-learning capabilities — This capability varies between RPA tools, but the basic RPA criterion is the ability to process structured data performing rulebased

tasks.

■ Automatic performance documentation — RPA tools can document audit trails, conduct calculations in the script, perform prescribed actions and trigger downstream activities.

■ Availability of dashboards to orchestrate work between people and bots or between bots — RPA tools should allow for the ease of monitoring and controlling usage. The sophistication of the dashboards vary for controlling multiple "robot" executables.

■ Knowledge of best-practice processes incorporated in to the tool — Today, most RPA tools have no preprogrammed process knowledge of vertical or horizontal processes. This is likely to rapidly change over the next couple of years. Today, however, many RPA tools come with wizards to detect the applications they will connect to and have a library of preprogrammed connectors to other software, such as SAP, Oracle and industry vertical-specific applications.

■ Security — It is important to establish what levels of security are required, and how the tool will handle access criteria.

Table 1 outlines the list of the various sources of RPA tools. If you have existing relationships with these vendors, consider them as an interesting starting point to learn about the tools.

Table 1. Indicative Listing of Types of RPA Tool Vendors

Specialist RPA software providers	Multiple software offerings including RPA	IT and BPO service providers that own proprietary RPA software
Automation Anywhere Blue Prism Contextor Epiance OpenConnect Kryon Systems UiPath	Jacada Lexmark (Kofax Kapow) Nice Pegasystems Verint Redwood Software WorkFusion	AssistEdge, owned by Infosys Syntel Tech Mahindra Xerox (soon to be Conduent)
BPO = business process outsourcing		

This research is new for 2016. The report outlines the approaches of 15 independent RPA software
vendors. These vendors have products used predominantly to replace people rekeying, consolidating or manipulating digitalized structured data in rule-based processes.

RPA tools are at the Peak of Inflated Expectations in our Hype Cycles as organizations look for ways to cut costs and new ways to quickly link legacy applications together.

RPA vendors have experienced a huge surge in global interest in the last 12 months from sharedservice center heads and managers of business process outsourcing (BPO) contracts. This is fueled by the promise of fast ROI. However, the potential to achieve strong ROI is entirely dependent on the applicability of RPA in each individual organization. Tasks that have high applicability for RPA include ones where significant rekeying is involved. Banks, insurance companies, and anyone with peaks and troughs in hiring and an unmodernized accounts or human resources suite of applications are finding potential for at least some, if not significant, RPA deployment.

Several RPA vendors are finding it hard to cope with the surge in demand both from direct sales and indirect sales. Indirect sales channels include all sizes of consultants, system integrators and BPO companies — even those that have built their own RPA-specific tool. Gartner expects to see more automation vendors rebranding or launching RPA software and RPA vendors adding more

process or task-specific capabilities to their software. In addition, vendors with RPA-like capability and specific process expertise are also adopting the RPA term to gain visibility. However, increasingly additional functionality is likely to be incorporated into the software product suite as RPA providers incorporate or integrate expert systems or smart machine technology to deliver more types of automation. Most RPA vendors do not have service capabilities are relying heavily on partners for both deployment and ongoing support and monitoring.

Representative RPA Vendors

The vendors listed do not imply an exhaustive list. This section is intended to provide more understanding of the market and its offerings.

Table 2 lists the overview of providers that have a style of RPA offering.

Table 2. Range of Players Offering Robotic Process Automation

Robotic process automation software providers	Product name	Total company revenue —2015/2016 estimate	Headquarters
Automation Anywhere	Meta Bot, IQ Bot	Privately held	U.S.
Blue Prism	Blue Prism	$16 million	U.K.
Epiance	—	Privately held	India
Infosys	AssistEdge	Part of Infosys, a $9.7 billion firm	India
Jacada	Jacada	$17 million	U.S.
Kryon Systems	Leo	Privately held	Israel and U.S.
Lexmark	Kofax Kapow	Part of Lexmark, a $3.5 billion firm	U.S.
Nice	Nice RPA	$1 billion	Israel
OpenConnect	OpenConnect	Independent software firm — privately held	U.S.
Pegasystems	Pega Robotics	—	U.S.
Redwood Software	—	Privately held — $40 million in 2015	U.K.
Syntel	SyntBots	Part of Syntel, only sold as part of a service contract	—
Tech Mahindra	Uno	—	India
UiPath	UiPath	Privately held	U.K.
Verint	Verint Robotic Process Automation	$1 billion	U.S.
WorkFusion	Smart Process Automation	Privately held	U.S.
Xerox Services (Soon to be Conduent)	Xerox Automation Suite (XAS)	$10 billion	U.S.

Automation Anywhere

Automation Anywhere is a privately held software company, which claims to have more than 500 clients. The company is headquartered in the U.S. with nine offices distributed globally on three continents. The overall employee count is around 350 with engineering labs in India and a followthe-sun support team.

The core of the system is front-end automation with support for recordings of rule-based respective tasks with support for a broad number of technologies. The tools are designed to emulate users and understand the data and objects on the screen via underlying metadata. This makes scripts somewhat but not completely robust to application changes. At the core of their platform is a RPA solution that does front-end automation for rule-based processes. Automation Anywhere is adding and deploying cognitive capabilities, which include machine learning for semi-structured processes that need expert decision making, including IQ Bots, Language Bots and more in development.

Analytics are included, real-time and provide both business and operational insights. Automation Anywhere promotes self-measuring bots through which businesses can constantly monitor the efficiency and effectiveness of their digital workforce. The solutions are designed to emulate human workers and understand the data and objects on the screen via underlying metadata that can make bots more robust and adaptive to application changes. Automation Anywhere allows the user to use components from its automation library, so end users can more easily create bots for a task or process. Automation Anywhere has support for security and National Institute of Standards and Technology (NIST) compliance. It supports third-party credential stores with Federal Information Processing Standard (FIPS)-compliant crypto and enterprise key management. Data at rest is protected with Advanced Encryption Standard (AES) 256-bit encryption and data in motion is protected with Transport Layer Security (TLS) 1.2. Its security features include a credential vault.

The company has partnerships with BPOs and advisory firms, including Accenture, Deloitte, KPMG, EY, PwC, Dell, Genpact, Infosys, Tata Consultancy Services (TCS), NTT Data, EXL, Alsbridge, L&T Infotech, SE2, Firstsource, HGS, Mindtree.

Blue Prism

Blue Prism has revenue of about $16 million in the middle of 2016, and is headquartered in U.K. with offices throughout the U.S. and partner representation globally. It was established in 2001 and launched its first software product in 2008. The Blue Prism software robots are designed to work in an independent mode in enterprise data centers or secure cloud platforms. The automations to be executed are configured in the Blue Prism configuration language, visually represented in a Visiolike interface and configured in reuseable "objects" that perform specific tasks. The technology includes an integration wizard that enables suitably trained operations staff to build connectors to mainstream commercial software including mainframes, Java, Citrix and HTML. Blue Prism has partnerships with smart machine capabilities software vendors that are specialists in this area, for example, intelligent character recognition, speech to structured data and cognitive technologies. The licensing model is an annual license, with a typical minimum commitment of 10 robots for three years. At the time of writing, it has 120 enterprise customers in the U.S., Europe and Asia/Pacific. The largest publicly nameable clients are BNY Mellon, RWE npower and Telefónica O2. Blue Prism is selling its software through solution partners, including Accenture, Avo Consulting, Alsbridge, Capgemini, Capita, Cofely EDF Suez, Cognizant, Linium, Deloitte, Nordic (Digital Workforce), eClerx, Enovation Solutions, Genfour, HCL Technologies, Hexaware, Hewlett Packard Enterprise (HPE), IBM, Lateetud, Miami Strategic Partners, Mphasis, Premier Logic, Prodapt, Reveal, Robotic Process Automation implementation (RPAi), Solai & Cameron, Sopra Steria Group, Symphony Ventures, TCS, Tech Mahindra, Telesis, The Burnie

Group, The Hackett Group, Thoughtonomy, Vector Solutions, Virtual Operations, VirtusaPolaris, Voyager, Weber Solutions and Wipro. Its product is most commonly used in the banking, insurance, healthcare, telecom, retail, logistics, government and BPO sectors. Blue Prism claims that most of its customers (more than 80%) are very large enterprises.

Epiance

Epiance is a privately held software company, headquartered in India. It was established in 2001 and has multiple software products, including Robotic Process Automation Platform and Epiplex for knowledge transfer and on-demand performance support. Its RPA software is called the Epiance Robotic Process Automation Platform and is built on a software tool that it developed in 2003. The Epiance bots can work in either an independent, unattended mode or assist operative mode. The programs to be executed are configured in JavaScript configuration language, based on C#, uses other technologies such as .NET, MeteorJS and MongoDB, and comes with preconfigured connectors for mainstream commercial software tools. It has an initial client for pattern matching, deep learning and smart machine capabilities that have been incorporated from Epiance to work with this RPA tool. The Epiance tool has a central control dashboard. The licensing model is an annual license model, with no minimum commitment to the number of bots licensed. It has five direct RPA customers and an additional 20 customers through a leading BPO partner. It is not available as SaaS as yet. Epiance has its own professional services group and also has a network of global partners. It is selling this tool both directly and through deployment partners, which include Intelenet and more than 40 other partners. Its product is most commonly used in the banking, insurance, healthcare, IT and telecommunication sectors. Epiance claims that most of its customers (more than 70%) are large enterprises, with more than $10 billion in revenue.

Infosys

Infosys is a $9.7 billion IT and business process services company, headquartered in India. It was established in 1981 with multiple BPO and IT services. Its homegrown RPA software is called AssistEdge, which is a scalable automation platform to modernize customer service, improve business processes and enhance operational productivity. AssistEdge is presently being used by more than 87 organizations globally and has 10,000 enterprise processes as preprogrammed automations. The largest two publicly nameable clients are Cisco and Vodafone. Infosys does the consulting, integration, support and customization of the product. The AssistEdge bots can work in either an independent mode or assist operative mode. The processes to be executed are configured in the AssistEdge platform, based on .NET and Java and come with preconfigured connectors for mainstream commercial software tools. The AssistEdge control tower is a standard part of the product, which allows work to be orchestrated between robots. AssistEdge security capabilities include encryption and obfuscation of the data; user profile and access management; and secure communication and remote controlling of the bots. Complete audit trails of the robot actions are also available. AssistEdge can be integrated with other Infosys tools, and is today an integral part of Mana, a new smart machine, pattern-matching software that Infosys launched in 2016 with an initial customer from the communications sector. AssistEdge licensing model can be annual, three-year or perpetual, based on client requirements and with no minimum commitment on number of bots licensed. You do not need to be a client of Infosys to procure this software tool. It is not available as SaaS yet. The product is most commonly adopted in the telecom, banking, insurance, retail, healthcare and manufacturing sectors. Infosys claims that most of its customers (more than 70%) are large enterprises, with more than $10 billion in revenue.

Jacada

Jacada is a $17 million software company, headquartered in the U.S. It was established in 1991 and has a number of software products aimed at reducing customer effort and improving customer service, across three major areas: automation technology with its agent desktop automation and robotic process automation products, digital transformation with its Visual IVR and SalesEngage products, and agent experience with its Unified Agent Desktop and Agent Next Best Action products. Jacada's RPA software is called Jacada Integration and Automation, or JIA for short. The Jacada bots can work in either an independent mode in a classic back-office or RPA deployment, or in an assisted mode such as on an agent's desktop in the contact center. Utilizing a nonproprietary approach, the programs to be executed or automated are configured in Visual Studio and extended in open-standard C#. JIA comes with preconfigured connectors for mainstream commercial software tools, HTML and mainframes. The Jacada automation suite includes BPM capabilities that allows work to be orchestrated between robots. Security capabilities include the ability to send automation commands through an encrypted protocol. This tool can be integrated with other Jacada products, such as Jacada Agent Scripting which provides additional agent guidance, Jacada WorkFlow for deep automation synchronization, and Jacada Advisor for Agent Next Best Action with automation. No pattern-matching, smart machine capabilities have been incorporated from Jacada to work with this RPA tool. However, Jacada's tools include a full graphical rule engine that allows implementations to "react" based on defined conditions. The licensing model is an annual license, with no minimum commitment to the number of bots licensed. The largest four publicly nameable companies using Jacada tools are the U.S. Navy, O2, Staples and Nationwide. Jacada's best customer outcome achieved from a single RPA implementation is the U.S. Navy, which used it in its $6 billion procurement process to automate 83% of manual processes. It is not available as SaaS as yet. Jacada has its own professional services group with offices in four regions and offers a 24/7 support model. It is selling this tool both directly and through deployment partners, which include Cognizant, Amdocs and Tech Mahindra. Its product is most commonly used in the government, telco and insurance verticals. Jacada claims that most of its customers (more than 90%) are large enterprises, with more than $10 billion in revenue. The Jacada RPA product roadmap includes adding cognitive capabilities, expanded "Next Best Action" capabilities and centralized management.

Kryon Systems

Kryon Systems is a privately held software company, headquartered in the U.S. and Israel. It was established in 2008 and offers a business-driven approach to automation. To this end, Kryon's Leo platform was designed for business users and can be leveraged for RPA as well as end-user application guidance and desktop automation delivering corporatewide business process improvement. The processes to be executed are generated in the Leo Studio using Kryon's proprietary deep-learning-based visual recognition technology and graphic interface. It also includes the ability to configure in multiple script languages (including .NET and Java) as well as integrate directly with other infrastructure platforms (for example, SAP, .NET and HTML). Kryon's patented technology facilitates the recording and execution of business processes on any application and cross-application without integration. The Leo Management Console is a webbased monitoring and control dashboard that enables remote configuration, scheduling and management of Leo Robots in real time. Leo is a client/server based architecture platform delivering full security capabilities. A separate product, the Leo Smart Scan system delivers an optical character recognition (OCR) mechanism for scanning documents for use in automation scenarios. Kryon Systems has further developed additional cognitive and machine learning capabilities for intelligent automation and processing of unstructured data. The licensing model is an annual license for the complete Leo Platform with the option to purchase additional individual components such as robots, Leo Studios or Leo Smart Scan to scale operations. Kryon Systems

has more than 50 global customers, the largest publicly nameable one being Hewlett Packard Enterprise. It is available as SaaS to some customers. Kryon Systems has its own professional services group. Its platform is field-proven since 2012, and Leo RPA has primarily been adopted since 2014 in the telecom, retail, healthcare, insurance and manufacturing sectors, though it could be used in any organization.

Lexmark (Kofax Kapow)

Kofax is owned by Lexmark, the software and document management company, which has revenue of $3.551 billion in 2015 and is headquartered in the U.S. Lexmark was established in 1991 and has multiple software products including Business Intelligence and Analytics Platforms, Case Management, intelligent business process management suite (iBPMS) and Customer Communication Management, and Enterprise Video. Its RPA software is called Kapow, which Kofax acquired in 2013. The Kapow product robots can work in either an independent mode or assist operative mode. The Kapow Design Studio provides an intuitive non-programming robot design environment where a process flow is visually mapped out as a robot designer clicks through an application or website to build a robot. Robot designers are able to incorporate business logic to handle exceptions, transform data and send alerts to users. Kapow includes snippets that are a group of steps that can be reused in several robots, and is maintained separately from the robot. The latest Kapow version 10, which was released in September 2016, includes new robotic automation support for desktop Windows and Java-based applications and native terminal integration. The Kapow Management Console is an integral part of the product, which manages the deployment and scheduling of robots, collaboration and sharing (robots, types, snippets, resources and credentials), manages user roles and permissions, controls access to detailed logs of production results and errors, and monitors the health and resource usage of robot servers. Security capabilities include role-based authentication and authorization, as well as audit logging, to provide a full audit trail of all user actions performed in the production environment. All communication can be encrypted with Secure Sockets Layer/Transport Layer Security (SSL/TLS), and the system does not need to run as a privileged user. The Kapow product can be integrated with other Kofax process services and products, such as Kofax TotalAgility (KTA). The KTA platform includes omnichannel capture, process management, process intelligence and analytics, mobile, e-signature, and RPA. Kofax advanced capture products offer machine learning for document classification, document separation, and data extraction of all document types, including structured forms, semistructured documents, and completely unstructured documents, which have been incorporated into larger customer solutions such as new customer onboarding, claims processing and mortgage lending. The licensing model is available as a perpetual or annual subscription license, with no minimum commitment to the number of bots licensed. Kapow licensing is based on a usage model — the number of robots, the frequency to which they run and the robot business' complexity. The Kapow license model enforces how many parallel robot operations can be executed simultaneously. Kapow licensing is independent of the target hardware environment and physical CPUs, which allows the flexibility of choosing cloud-based or on-premises and virtualized or physical CPU environments. Today, Kapow has approximately 400 RPA customers. The largest three publicly nameable RPA ones are Union Bank, Delta Dental of Colorado and Arrow Electronics. It is not available as a SaaS offering, but can be deployed by clients into an Amazon EC2 or Microsoft Azure cloud environment. Kofax has its own global professional services group of more than 200 people for support in initial deployments. It is selling the product both directly and through reseller and system integrator partners. Kofax has a long history with BPO partners that utilize other Kofax products, and Kapow is a product that is starting to be introduced into the Kofax BPO partner base. Its Kapow product is most commonly used in banking, insurance, logistics/transportation,

retail and manufacturing sectors. Kofax claims that most of its customers (more than 60%) are large enterprises, with more than $1 billion in revenue.

Nice

Nice is a $1 billion software company and is headquartered in Israel. It was established in 1986 and has multiple customer engagement software products. Its RPA software is called Nice Robotic Automation and is built on a software tool that Nice acquired in 2010. The Nice bots can work in either an independent mode or assist operative mode. The programs to be executed are configured in the Nice configuration language, based on .NET technology and come with preconfigured connectors for mainstream commercial software tools. The Nice control dashboard is an integral part of the product, which allows work to be orchestrated between robots and provides an alerting mechanism for outstanding issues. Security capabilities include strict security measures, including data encryption, active directory integration (Lightweight Directory Access Protocol [LDAP] or Windows Single Sign-On [SSO]), secure communication (over HTTPS) and role-based access. Today, no pattern-matching smart machine capabilities have been incorporated from Nice to work with this RPA tool, but Nice does include them in its product roadmap. The licensing model is a perpetual or term-based license, with no minimum commitment to the number of bots licenced. It has more than a dozen RPA customers and more than 200 customers currently using its desktop automation solution. The largest three publicly nameable ones are Telefonica, IKEA, Helpline (contact center serving the ICBPI group of banks in Italy) and BPS (Banca Popolare di Sondrio). In addition, Nice has implemented RPA in one of the biggest banks in the U.S. and at a large European government office. Nice Robotic Automation is available on the cloud, currently only in hosted mode. SaaS will be added in the near future. Nice has its own professional services group with about 20 people for support in initial deployments. It is selling this tool both directly and through deployment partners, which include Capgemini, Symphony Ventures, PwC, Group Elite Communications, Almato, RES, Pegamento, Sinclair Voicenet and Weber. The most successful customer implementations are of self-enabled customers who are proficient with the Nice Designer software and are able maintain their own automation environment on an ongoing basis. Nice has an active user community (Nice User Group) with dedicated activity around its automation solutions. Its product is most commonly used in the banking, telecommunications, insurance, healthcare, and government sectors. Nice claims that most of its customers (more than 70%) are large enterprises, with more than $10 billion in revenue

OpenConnect

OpenConnect is a privately held software company, headquartered in Dallas, Texas. It was established in 1982 and has four software products: AutoiQ, WorkiQ, ConnectiQ and WebConnect. The first three of these tools can work together as an automation platform. The OpenConnect bots can work in either an independent mode or assist operative mode. The programs to be executed are configured in the OpenConnect proprietary configuration language and come with preconfigured connectors for mainstream commercial software tools, mainframes and web interfaces. The OpenConnect control dashboard is an integral part of the product, which allows work to be orchestrated between robots. Security capabilities include high-level encryption. No patternmatching smart machine capabilities have been incorporated from OpenConnect to work with this RPA tool; however, WorkiQ is a big data analytics application that indicates the best processes to automate. The licensing model is a multiyear term license, with a minimum of 10 robots per license. It has about 100 RPA customers. It is not able to name any clients in public; however, it is used by multiple U.S. healthcare claims companies. It is not available as SaaS yet.

OpenConnect has its own professional services group for support of initial deployments as well as ongoing services. Today, it is selling this tool directly. Its product is most commonly used in the health insurance sector. OpenConnect claims that most of its customers (more than 70%) are large enterprises, with more than $10 billion in revenue.

Pegasystems

Pegasystems acquired OpenSpan in April 2016. Pegasystems is a public company, headquartered in Cambridge, Massachusetts. In addition to the newly acquired robotics capability, Pegasystems offers CRM solutions and several industry-specific applications. Pegasystems has aimed its RPA capability for user process improvement, automation and analytics. Since the acquisition, the OpenSpan software was unified into the Pega platform and has become a collection of Pega modules under the umbrella of "Pega Robotic Automation and Intelligence." Key modules include:

■ Pega Robotic Automation Studio — Where bots are configured; comes with preconfigured connectors for mainstream commercial tools, HTML and mainframes.
■ Pega Robotic Process Automation — Runs bots autonomously and on desktop.
■ Pega Robotic Desktop Automation — Runs bots on desktop.
■ Pega Workforce Intelligence — A big data analytics solution to discover and improve employee productivity.
■ Pega Robotic Automation Console — Clients can now create and manage work queues bots and humans when used with Pega's business process and case management tools.

Pega Robotic Automation currently has no pattern-matching smart machine capabilities, although the company's Customer Decision Hub has advanced event detection, event processing, predictive and adaptive analytics. The company's roadmap shows these technologies benefiting from one another in the future. Clients can choose fixed-term, cloud or perpetual licenses. RPA is licensed by each of a client's named users with a minimum of 150 users. RPA is licensed by annual number of cases and complexity of work. Workforce Intelligence is licensed by number of users. RPA and Workforce Intelligence are available on the cloud; RPA is also available as an on-premises solution. Existing clients of Pegasystems can add robotics with a percentage uplift on existing licenses. Pegasystems has retained all OpenSpan employees, expanding the professional services group of 60-plus people for support in initial deployments. It is selling robotics through a direct sales force and through solution partners with areas of specific industry expertise, especially in banking and communications. Its robotics product is most commonly used in the government, banking, manufacturing and communications sectors. Pegasystems claims that most of its robotics customers (more than 70%) are large enterprises, with more than $10 billion in revenue. Pegasystems reports a significant rise in interest and pipeline since it introduced the new robotics capability at its annual user conferencee in June 2016.

Redwood Software

Redwood Software, headquartered in the U.K., has revenue of $40 million in 2015. It was founded in 1993 as a multiple product software company for automation of processes (Cronacle and RunMyJobs) and automation of output (Report2Web). Its latest solutions focus on the robotization of end-to-end business processes across record-to-report, order-to-cash, procure-to-pay, HR and supply chain. Its first Enterprise Process Robotics solution was launched in 2014, as RoboClose, RoboFinance and RoboSupplyChain. Redwood Software has a team of 30 people globally that can deploy its Enterprise Process Robotics solution at customers. This team consists of IT architects, robot engineers, process analysts and directors of business transformation with

specific process domain expertise in areas such as finance and supply chain. Support is delivered from the Netherlands and Raleigh, North Carolina. The direct support team consists of a total of 12 people, which is backed up by a team of 50 to provide development support if needed. Redwood Software's license model is annual subscription per process, and is also related to organizational size and complexity. For example, RoboFinance is priced per-process, per-legal entity, with different prices for monthly and daily processes. The pricing principle is to measure by business process outcome, not by a measure of the number of robots or by feature or function. Publicly nameable clients include SAP, Genentech (Roche Group) and DSM, and partners include Deloitte, KPMG, EY, PwC and Accenture. Its product development plans include providing key performance indicators (KPIs), SLAs and dashboards to help customers measure and improve thousands of robots and millions of robot executions per week, both generically (for example, how often does a certain robot run and how long does it take), and for specific robotized processes (for example, the monetary value of outstanding accounts receivable [AR] processed by a robot). It is also working on deeper and broader integration with operating systems, applications and APIs in order to make developing robots simpler. Finally, it is working on standard robots in specific verticals for finance-specific and accounting-specific processes and high-level processes in common ERP applications. Its targeted sectors include manufacturing (aerospace, auto, industrial and high-tech); retail and consumer products; banking, financial services and insurance; healthcare and pharmaceutical; government and public sector; and communications, telecom and media.

UiPath

UiPath was established in 2005, based in Bucharest, Romania, and focused on developing automation components for software firms, most notably IBM and Microsoft. Now headquartered in London, the company has specialized in RPA software since 2013. UiPath's first product line introduced process modeling based on Microsoft Windows Workflow Foundation (as found in SharePoint and Visio), .NET and preconfigured connectors; robots were equipped with computer vision for Citrix environments — technology that is being used in development UiPath's current strategic move to an AI-first operating model. The current RPA product suite consists of UiPath Studio, Orchestrator and Robots, and is predominantly used in the insurance, banking, manufacturing, utilities and government sectors. UiPath robots work in either autonomous, no human interaction back-office mode or agent assist front-office mode. Studio's recorder and library of standard and/or customer workflow snippets promotes reuse and efficient automation. Orchestrator is integral to the suite, managing robots and work queues. Security capabilities comply with IT enterprise requirements, with robots able to run on locked desktops. UiPath's licensing model is an annual subscription license, with no minimum commitment to the number of robots. A platform as a service (PaaS) model, with the product suite available on either Azure or Amazon Web Services (AWS), is also offered. The company has a 30- person professional services group to support customers as they ramp up and build center of excellence (COE) capabilities; however, UiPath forecasts that 90% of revenue will come through its partner channel by the second quarter of 2017. It currently has 127 partners in all major geographies in the U.S., Europe, Asia and Australasia, including Accenture, Capgemini, Cognizant, Deloitte, Genfour, EY, PwC and Symphony Ventures. UiPath has 146 RPA customers — including 25 of the top 500 global companies — 80% of which are global enterprises with more than $10 billion in revenue. The largest companies without disclosure restraints are Swiss Re, Aon Hewitt and Capgemini.

Verint

Verint is a more than $1 billion software company, headquartered in Melville, New York. Verint has more than 35 offices worldwide and 5,000 employees with a global partner network. It was established in 1994 and has multiple customer engagement software products. Verint has just launched an RPA software product called Verint Robotic Process Automation, which is a product Verint is licensing from a partner to incorporate into its product set. The Verint software robots can work in either an independent mode or an employee assistance mode. The processes to be automated are configured in the product's authoring studio using the same applications and processes followed manually by employees, and can automate processes across multiple applications without requiring plug-ins or integrations. The management console is an integral part of the product, which allows work to be scheduled to different robots. Today, no pattern-matching smart machine capabilities have been incorporated to work with this RPA tool. The licensing model is a perpetual license, priced per robot, with no minimum commitment to the number of robots licensed. Verint Process Assistant is priced per named employee, perpetual license. It is just starting to build RPA customers for this offering. It is not yet available as SaaS. Verint is selling this tool directly and has a large professional services group. As it has just launched the product, Verint is just starting to gather its own customer base.

WorkFusion

WorkFusion is a privately held company, headquartered in U.S. It was established in 2011 with four offices in North America, Europe and India. It offers a stand-alone RPA tool called Smart Process Automation (SPA) as well as an RPA as a part of a broader set of machine learning, cognitive automation and crowdsourcing products marketed as WorkFusion Intelligent Automation. In addition to RPA, WorkFusion SPA offers additional unstructured data processing capabilities that train machine learning algorithms by observing manual work. WorkFusion SPA can work in either unattended mode or in machine assist mode. Automations are configured in WorkFusion Studio, which itself is based on the Eclipse Java Integrated Development Environment (IDE) and comes with preconfigured automation templates and connectors for mainstream commercial software tools. The WorkFusion SPA control tower dashboard is an integral part of the product, which allows work to be orchestrated between RPA bots, cognitive bots and people. Security capabilities include both built-in access control and enterprise integrations with opular SSO and entitlement management platforms. The licensing model is an annual subscription license, with no minimum commitment to the number of bots licensed. WorkFusion has 35 large enterprise RPA customers, the largest three publicly nameable ones are Deutsche Bank, Standard Bank and IHS Markit. WorkFusion SPA is available in both on-premises and cloud-based SaaS models. WorkFusion has its own professional services group focused on implementation services. It is selling this tool directly and through deployment partners including Cognizant, Wipro, and TCS. Its RPA product was introduced in 2014 and to date has primarily been adopted in banking, financial services and insurance sectors. WorkFusion SPA can be applied to industry-specific processes such as know-your-customer or anti-money laundering as well as shared services process in finance and accounting for any large organization. WorkFusion's product roadmap includes launching a self-service WorkFusion RPA Express product and expansion into conversational automation with WorkFusion Chatbots.

Xerox Services

Xerox Services is the business process services arm of Xerox, formerly known as Affiliated Computer Services (ACS), which was established in 1988. It is a $10 billion services company, headquartered in the U.S. Its RPA software is called the Xerox Automation Suite (XAS) and is built on a software platform Xerox initiated in 2008. This software product is only available to customers of Xerox Services, as part of a BPO offering. The XAS bots can work in an independent

mode or operate in an interleaved mode with human actions. The workflows are configured using the XAS design tool that can be extended with custom actions using industry standard languages. XAS has standard connectors for popular systems such as web pages, mainframes, databases and Microsoft Office. The Xerox control dashboard is an integral part of the product, which allows work to be orchestrated between robots. XAS is built on top of the latest Microsoft and web technology, and leverages current industry standards for encryption and access control. XAS limits the exposure of confidential data to human touch. XAS provides optional integration with WDS Virtual Agent and WDS Agent IQ software, which provides natural-language processing (NLP) and machine learning capabilities. XAS is offered as part of a BPO contract with terms associated with the contract. It has more than 300 RPA installations. XAS is available as a hosted solution or on-premises solution. Xerox Services has its own professional services group to perform and support deployments. It is selling this tool to Xerox Services customers. Support locations include Australia, Great Britain, Guatemala, France, India, Ireland, New Zealand, Romania, South Africa and the U.S. Xerox Services has more than 500 dedicated professionals in development, testing, integration, implementation, program management office (PMO), maintenance and support in the automation group. Xerox Services has clients in the healthcare, public sector, financial services, insurance, automotive, telecom and transportation industries. Xerox Services claims that most of its customers (more than 70%) are large enterprises and public agencies.