

# The Forrester Wave™: Robotic Process Automation, Q2 2018

The 15 Providers That Matter Most And How They Stack Up

by Craig Le Clair  
June 26, 2018

## Why Read This Report

In our 30-criteria evaluation of robotics process automation (RPA) providers, we identified the 15 most significant — Another Monday, AntWorks, Automation Anywhere, Blue Prism, Contextor, EdgeVerve, Kofax, Kryon, NICE, Pegasystems, Redwood Software, Softomotive, Thoughtonomy, UiPath, and WorkFusion — and researched, analyzed, and scored them. This report shows how each provider measures up and helps infrastructure and operations (I&O) professionals make the right choice.

## Key Takeaways

### **UiPath, Automation Anywhere, And Blue Prism Lead The Pack**

Forrester's research uncovered a market in which UiPath, Automation Anywhere, and Blue Prism are Leaders. WorkFusion, Pegasystems, NICE, Kryon, Kofax, EdgeVerve, and Thoughtonomy are Strong Performers. Redwood Software, Contextor, Softomotive, AntWorks, and Another Monday are Contenders.

### **Features Commoditize, But There's Still Room For Platform Distinction**

Application control features are now table stakes. Security, desktop analytics, multitenancy, design ease, and deployment efficiency make products stand out.

### **Governance And Analytics Remain Top Battlegrounds**

As RPA matures, analytics will dictate which providers lead the pack. Vendors that provide text analytics, artificial intelligence (AI) component integrations, process analytics, and surface automation based on computer vision will position themselves to deliver successfully.

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by [Craig Le Clair](#)

with [Glenn O'Donnell](#), William McKeon-White, and Diane Lynch

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### Related Research Documents

- [Inquiry Spotlight: Forrester's RPA Inquiries Reveal Activity But Low Maturity](#)
- [The RPA Market Will Reach \\$2.9 Billion By 2021](#)
- [RPA Operating Models Should Be Light And Federated](#)



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## What A Year It's Been: RPA Then And Now

I&O leaders know that the RPA market is fast moving — in a short 12 months, features that stood out in our 2017 Forrester Wave™ are now table stakes.<sup>1</sup> Deployment efficiency, scale, training breadth, new ways to look at governance, and advancing analytics highlight this year's platform evaluation.

### Feature Convergence, Deployment Efficiency, And Security Define The Market

RPA has followed the pattern of many software markets: Needed features rise to the top, providers review competitor platforms, and enterprises push vendors toward a set of “must have” capabilities. The market is maturing, which has resulted in:

- › **Products that begin to converge.** Many platforms have capable features such as application control, optical character recognition (OCR) and surface automation, and central management. Over the past year, these core RPA features have become standard. Analytics, deployment efficiency, scale, and governance now distinguish providers.
- › **Attended bot issues that rise to the surface.** Conversational bots are the focus of contact center operations. Attended bot support — not the biggest RPA market opportunity — has nevertheless inched forward as an area that separates vendors. Attended automation must listen for an event, access an API, or hand a task off to a back-office bot. Not all vendors handle this integration well. Controlling front-office bots requires special attention. Instead of a controlled server, you may have bots on hundreds of PCs, with variations in hardware, software, and humans.
- › **A focus on deployment efficiency.** A digital worker can be idle much of the time, waiting for a human, an event, or a scheduled time to punch the clock. But there's nothing idle about software license, infrastructure, or support costs. As RPA has matured, enterprises have tried to minimize license costs, resource requirements, and customization. In response, providers have improved bot orchestration and introduced more-flexible license approaches that better utilize digital workers.
- › **A need for multitenancy for shared services and security.** Partitioning platform functions is valuable to provide shared services (e.g., separate control towers for multiple departments) and for security (e.g., separate functions for General Data Protection Regulation [GDPR] requirements). Enterprises differ on whether single or multitenant approaches are best for them. Some prefer single tenancy due to lower cost and complexity; others, a smaller set, choose multitenancy for greater security and control.<sup>2</sup> Most providers now support role-based access control that help with these requirements, but only a few support multitenant deployments.
- › **Security requirements that get clearer but more difficult.** We've scratched the surface of security issues raised by a digital workforce. Two-factor authentications for bots (they don't carry phones), payment card industry (PCI), and Sarbanes-Oxley (SOX) Act compliance, for example, are now concerns. Encrypted bot credentials in secure vaults are now generally available. Encrypted data in automation queues, out-of-the-box connection to CyberArk, GDPR protection, separation

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of user credentials and customer data from developers, and audit reports created without need of the programmers who built the automation are now must-haves.<sup>3</sup>

**Process Analytics And Governance Support Distinguish Platforms**

By 2021, Forrester estimates there will be more than 4 million robots doing office and administrative work as well as sales and related tasks.<sup>4</sup> That's a lot of robots running loose. And so far, the business — with outside services help in most cases — is building most of them. Small automation groups pop up like dandelions in spring and start building bots. Organizations often bring in IT as an afterthought. Governance, robot management, and process analytics are growing in importance. Our research found that:

- › **Proper governance blurs human and robot treatment.** New this year is an emerging and important view: You should govern RPA digital workers in much the same way as you do human employees. It's a bit creepy, perhaps. But keep audit logs for the bot life cycle from creation to deletion, tracking the bot's assigned manager, performance, and even documenting any training. This will keep track of and help you report on your digital workers.
- › **Central control of robots has become a focus area.** Most vendors have improved central control rooms. As the market matures, features like end-to-end visibility for robots, real-time rolling view, and clean separation of automations from control and scheduling become a focus. Work queues, schedules, execution rules, and support to spin up and stop robots all reduce the need to edit scripts for individual robots and enhance deployment efficiency.
- › **Process knowledge gaps create new governance issues.** Human process knowledge is an undervalued commodity, and once programmed into the robot, much of it disappears. With the people now gone, many fear that no one will remain to second-guess the machine. Like the bakery that depends on a mix with the original recipe lost, the operation has a new form of exposure. Governance that includes process documentation and audit trails for decisions made must fill that gap.

**To Get Value From RPA, Combine It With AI Skill Sets**

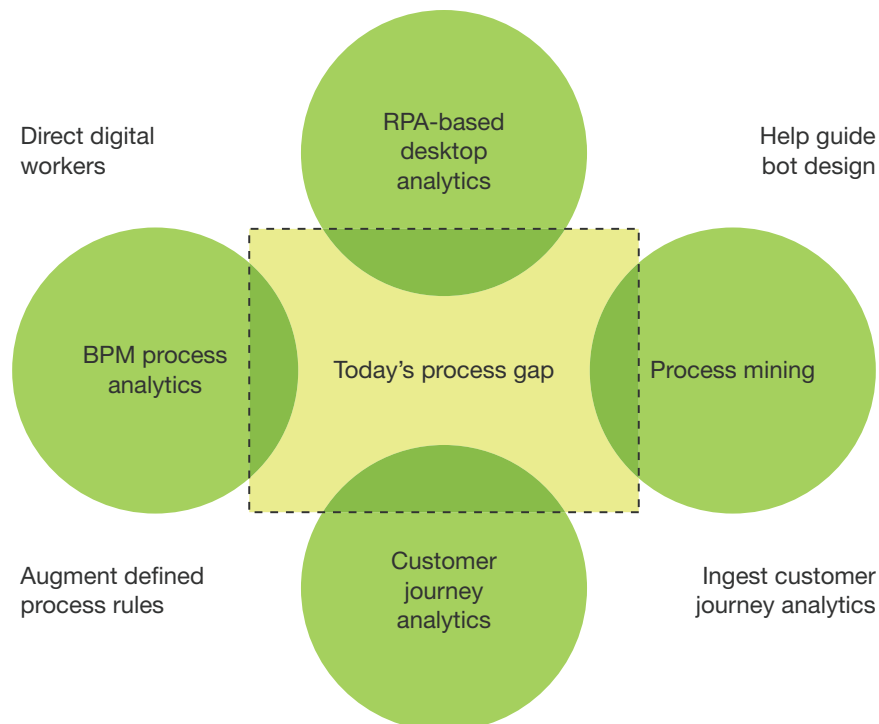
The early phase of the RPA market favored "simple" processes with the three fives: fewer than five decisions, fewer than 500 clicks, and fewer than five apps accessed. Find the tasks that have high transaction volume, and you'll strike RPA gold. But these tasks will become harder to find; RPA must get smarter to escape these modest roots. AI won't replace RPA, but RPA tools that use AI will replace RPA tools that don't. Most providers in our research understand this. As a result, we found that:

- › **Text mining applied to unstructured content lifts RPA's value.** Text analytics enhances the strategic value of RPA. Typical documents in scope include insurance, medical claim forms, invoices, purchase orders, and emails. Unstructured text fields are scattered throughout such documents. Before these text fields can become actionable in RPA, a process must extract structures — simple ones like names, times, and locations, and complex ones like sentiment, effort, and intent. Leading vendors stepped up their game with partnerships or native extensions.

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- › **Analytics to reduce bot maintenance has improved.** Bot maintenance costs are a big deal. For a European electrical utility, maintenance costs due to application changes, exceeded licensees, and infrastructure costs diluted the expected ROI. Approaches vary. Surface automation, e.g., OCR combined with computer vision and a simple neural net, can interpret bot changes. Other approaches have the bots connect to the application through the objects or labels. In either case, an alert can go to the control tower with hints on how to fix the bot. In two years, analytics will understand those changes and help robots adjust autonomously.
- › **Broader process assessment is developing quickly.** Several vendors (e.g., Infosys, Kryon, and UiPath) advanced their analytics to attack broader process improvement. This combines process mining data with traditional RPA desktop analytics to create heat maps to guide bot design and bot behavior. This will evolve to include process data from business process management (BPM) and customer journey analytics (see Figure 1).
- › **Vendor AI road maps differ.** We compared road maps, number of current AI projects, and native depth in analytics. We found that RPA AI support combines proprietary and open source approaches. Some vendors (e.g., NICE, Pegasystems, and WorkFusion) mostly depend on their own AI algorithms and incorporate them into their products. Others link to AI platforms from cloud or open source partners (e.g., IBM Watson or Microsoft Azure ML cloud options as well as Blue Prism and Kryon).

**FIGURE 1** RPA Vendors Are On A Mission To Close The Process Gap

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## Specialists And Emerging Providers Enter The Market Landscape

The surging RPA market has created many new entrants. Forrester counts 32 RPA product vendors. Some are new initiatives, but most are transitioning from adjacent automation work. This transition spans from a service orientation to products, from a domain such as IT testing to the broader market, or from a more general workflow automation. Several companies not included in this Forrester Wave evaluation may align with your needs. Consider:

- › **Intellibot, a growing India-based company with strength in Asia Pacific.** Intellibot's strengths include computer vision and easy-to-use visual programming for automation design. Information retrieval for customer service, data population, letter generation, email monitoring in finance, and HR domains were early wins. It also boasts use cases in IT service desk and service monitoring.
- › **OpenConnect, a provider moving from insurance to the general market.** Mainframe automation and a depth in health insurance customers began OpenConnect's journey. Expanded capabilities for the general market have augmented this scalable — but narrow — offering.
- › **Servicetrace, a vendor that has moved beyond IT use cases.** Servicetrace came from test automation and now has a broader RPA and automation platform for the general market. This vendor is betting that many RPA platforms won't meet GDPR requirements. For example, if using VMware, an administrator must not see and interact with user data, and workflow designers can't have access to bot credentials. Continued success with enterprise-grade customers like Deutsche Telekom will help that effort.

## Robotic Process Automation Evaluation Overview

To assess the state of the RPA market and see how the vendors stack up against each other, Forrester evaluated the strengths and weaknesses of top RPA vendors. After examining past research, user need assessments, and vendor and expert interviews, we developed a comprehensive set of evaluation criteria. We evaluated vendors against 30 criteria, which we grouped into three high-level buckets:

- › **Current offering.** Each vendor's position on the vertical axis of the Forrester Wave graphic indicates the strength of its current offering. Key criteria for these solutions include bot development features, management and reporting, analytics, architecture, use case support, governance, and scalability.
- › **Strategy.** Placement on the horizontal axis indicates the strength of the vendors' strategies. We evaluated execution on strategy, partnership ecosystem, innovation and market approach, and product road map.
- › **Market presence.** Represented by the size of the markers on the graphic, our market presence scores reflect each vendor's enterprise RPA bot deployments, RPA customers, and product revenue.

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**Evaluated Vendors And Inclusion Criteria**

The RPA product landscape includes enterprise-level providers that can support the requirements of a shared service. Forrester included 15 vendors in the assessment: Another Monday, AntWorks, Automation Anywhere, Blue Prism, Contextor, EdgeVerve, Kofax, Kryon, NICE, Pegasystems, Redwood Software, Softomotive, Thoughtonomy, UiPath, and WorkFusion. Each of these vendors (see Figure 2):

- › **Has a product orientation rather than a service orientation.** The RPA service and integration community is expanding rapidly. For this evaluation, each RPA vendor must actively market and promote an RPA software platform for the RPA market. This means that enterprises must be able to deploy RPA independently of the software provider and have business process outsourcing or systems integration partners.
- › **Has strong breadth of RPA functionality.** Participants must support a broad range of use cases, such as attended operations in contact centers; unattended, server-based solutions for finance and accounting; data pooling and collection; or IT service management. Vendors must integrate and support these capabilities well and administer them through a cohesive platform.
- › **Markets actively in at least two major regions.** Primary RPA regions are North America; Europe, the Middle East, and Africa (EMEA); Asia Pacific; and Latin America. Each vendor must have existing clients in at least two regions and either a direct sales presence or partners that are actively distributing and implementing its solution.
- › **Meets the minimum revenue requirements.** RPA vendors must have at least \$5 million in total software revenue derived from RPA.
- › **Has significant market share or is an innovator developing new capabilities.** Vendors must have a market share presence for RPA or be a leader in providing innovative solutions. We asked each vendor to provide three references, representing a diversity of industries, company sizes, and geographies, that have had its RPA software in production for at least one year.
- › **Generates strong customer interest.** Through Forrester inquiries, consulting engagements, media requests, and ongoing conversations with players in the market, we developed an understanding of the demand for the vendors and solutions included in this evaluation.

**FIGURE 2** Evaluated Vendors: Product Information And Selection Criteria

Vendor	Product
Another Monday	Another Monday RPA
AntWorks	ANTstein
Automation Anywhere	Automation Anywhere Enterprise, Bot Insight, Bot Farm, Bot Store, and IQ Bot
Blue Prism	Blue Prism
Contextor	Contextor Studio, Control, Standalone Bot, and Galaxy
EdgeVerve	AssistEdge
Kofax	Kapow
Kryon Systems	Kryon RPA
NICE	NICE Robotic Automation
Pegasystems	Pega Robotic Automation and Intelligence
Redwood Software	Redwood Robotics
Softomotive	ProcessRobot and WinAutomation
Thoughtonomy	Thoughtonomy Virtual Workforce
UiPath	UiPath 2018.1
WorkFusion	WorkFusion Intelligent Automation

**Vendor inclusion criteria**

- Each vendor has a product orientation rather than a service orientation.
- These providers have strong breadth of RPA functionality.
- Each vendor markets actively in at least two major regions.
- Vendors meet the minimum revenue requirements.
- Each vendor has significant market share or is an innovator developing new capabilities.
- These providers generate strong customer interest.



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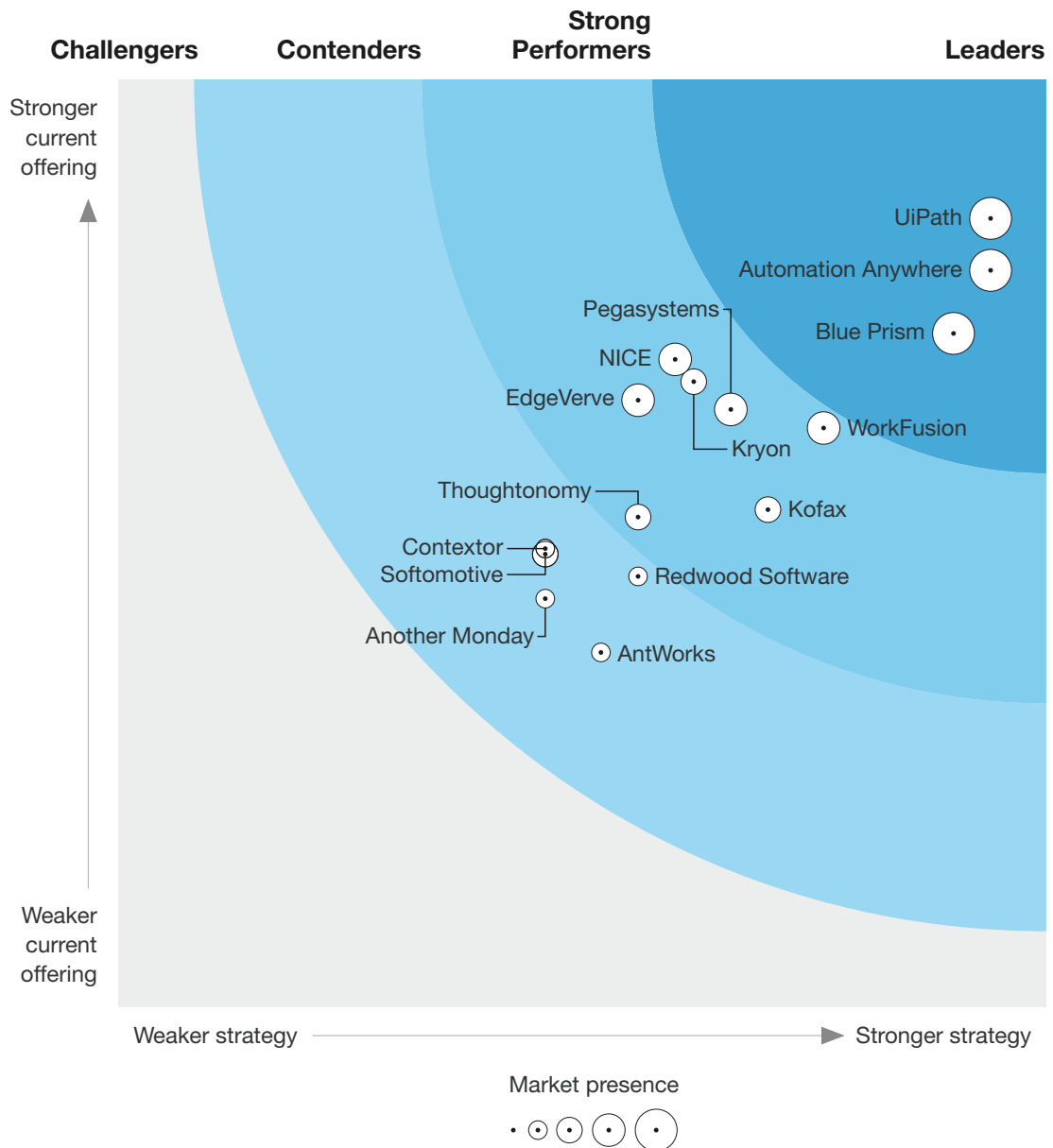
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## Vendor Profiles

The offerings of these vendors are quite diverse, each with its unique strengths and weaknesses. Because many clients have made strategic investments in complete RPA platforms, Forrester broadly included a complete list of capabilities. We intend this evaluation of the RPA market to be a starting point only and encourage clients to view detailed product evaluations and adapt criteria weightings to fit their individual needs through the Forrester Wave Excel-based vendor comparison tool (see Figure 3 and see Figure 4). Use the custom features of this tool to emphasize the use case area of interest — e.g., attended operations, advanced analytics, or Citrix deployments where the goal may not be complete enterprise coverage. Click the link at the beginning of this report on Forrester.com to download the tool.

**FIGURE 3** Forrester Wave™: Robotic Process Automation, Q2 2018

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**FIGURE 4** Forrester Wave™: Robotic Process Automation Scorecard, Q2 2018

	Forrester's weighting	Another Monday	AntWorks	Automation Anywhere	Blue Prism	Contextor	EdgeVerve	Kofax	Kryon
<b>Current offering</b>	50%	2.20	1.91	3.97	3.63	2.47	3.27	2.68	3.37
Bot development/core UI/desktop functions	20%	2.50	2.00	3.50	3.00	3.00	3.50	3.00	4.00
System management and reporting	15%	3.00	3.00	3.66	3.00	3.00	3.68	3.00	2.34
0 analytics	15%	1.00	2.90	4.00	3.00	2.00	4.30	2.00	4.20
Architecture	10%	3.00	1.66	4.34	4.32	3.00	3.00	2.98	3.66
Breadth of use cases/process support	15%	1.00	1.40	4.00	3.40	2.00	3.00	2.80	3.60
Governance, security, and service availability	15%	3.68	1.00	4.32	5.00	2.34	3.02	3.00	3.02
Shared service and scalability	10%	1.00	1.00	4.34	4.34	1.66	1.66	1.66	2.34
<b>Strategy</b>	50%	2.30	2.60	4.70	4.50	2.30	2.80	3.50	3.10
Execution on enterprise RPA strategy	25%	3.00	3.00	5.00	3.00	3.00	3.00	5.00	3.00
Partnership ecosystem	35%	1.00	1.00	5.00	5.00	1.00	1.00	3.00	1.00
Innovation and market approach	15%	3.00	5.00	3.00	5.00	3.00	3.00	3.00	5.00
Product road map and differentiation	25%	3.00	3.00	5.00	5.00	3.00	5.00	3.00	5.00
<b>Market presence</b>	0%	1.66	1.66	5.00	5.00	1.66	3.66	3.00	3.00
Enterprise RPA seats/bots sold to date	34%	1.00	1.00	5.00	5.00	1.00	3.00	3.00	3.00
Enterprise customers	33%	1.00	3.00	5.00	5.00	3.00	3.00	3.00	3.00
Product revenue	33%	3.00	1.00	5.00	5.00	1.00	5.00	3.00	3.00

All scores are based on a scale of 0 (weak) to 5 (strong).

**FIGURE 4** Forrester Wave™: Robotic Process Automation Scorecard, Q2 2018 (Cont.)

	Forrester's weighting	NICE	Pegasystems	Redwood Software	Softomotive	Thoughtonomy	UiPath	WorkFusion
<b>Current offering</b>	50%	3.49	3.22	2.32	2.44	2.64	4.25	3.12
Bot development/core UI/desktop functions	20%	3.50	3.50	1.50	3.50	3.00	4.50	2.50
System management and reporting	15%	2.34	3.68	2.34	2.34	3.00	4.32	3.66
RPA analytics	15%	3.50	3.80	1.70	2.20	1.80	3.50	4.20
Architecture	10%	3.66	3.00	3.66	3.00	3.66	5.00	2.98
Breadth of use cases/process support	15%	4.00	3.00	2.40	1.60	2.00	4.00	2.40
Governance, security, and service availability	15%	4.34	2.34	3.00	2.34	2.34	4.32	3.68
Shared service and scalability	10%	3.00	3.00	2.36	1.66	3.00	4.32	2.34
<b>Strategy</b>	50%	3.00	3.30	2.80	2.30	2.80	4.70	3.80
Execution on enterprise RPA strategy	25%	3.00	3.00	5.00	3.00	1.00	5.00	3.00
Partnership ecosystem	35%	3.00	3.00	1.00	1.00	3.00	5.00	3.00
Innovation and market approach	15%	3.00	5.00	3.00	3.00	5.00	3.00	5.00
Product road map and differentiation	25%	3.00	3.00	3.00	3.00	3.00	5.00	5.00
<b>Market presence</b>	0%	3.66	3.66	1.66	2.36	3.00	5.00	3.66
Enterprise RPA seats/bots sold to date	34%	3.00	3.00	1.00	5.00	3.00	5.00	3.00
Enterprise customers	33%	3.00	3.00	1.00	1.00	3.00	5.00	5.00
Product revenue	33%	5.00	5.00	3.00	1.00	3.00	5.00	3.00

All scores are based on a scale of 0 (weak) to 5 (strong).

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**Leaders**

- › **UiPath is a Leader with shared services and ease of bot design.** Founded in 2005 in Romania, UiPath started out developing software development kits (SDKs). It closed 2017 at \$43 million and is targeting four times that for 2018, making it one of the fastest-growing RPA vendors. UiPath is eyeing a more direct market approach, particularly for major accounts like Sumitomo Mitsui Banking Corporation in Japan, but its success to date hinges on its appeal to integration partners, savvy end users, and OEM arrangements (e.g., Oracle). The design studio is based on Microsoft's Workflow Foundation, and design is with Microsoft Suite components that garner high usability marks. UiPath Studio provides multiple methods to organize activity and tasks that cover a range of skills. The platform easily handles attended robots developed by employees as well as unattended robots that can handle large-scale processing.

Enterprises have rewarded UiPath's open approach. Third-party components include Elasticsearch, Kibana, and Tableau for visualization as well as CyberArk — if required — for credential management. UiPath has 15 partners with natural language processing (NLP), intelligent optical character reader (IOCR), machine learning (ML), and chatbots directly integrated with Orchestrator, the central control point. Multitenancy is a strength that other platforms don't provide as easily. UiPath helps share platform components across departments and separate data and access to meet GDPR requirements. Reference customers noted its deployment efficiency. It has enhanced its cognitive capabilities for unstructured data with ABBYY FlexiCapture and other third-party products. Computer vision with ML addresses application change management and Citrix integration. UiPath's Studio natively provides smart recording with optimization, but a partnership with Celonis process mining steps up its game with a shared process repository and, in the future, an ML learning environment that will design and direct bots. UiPath needs improved ability to manage reusable automations (e.g., for error handling and logging) versioned within the platform. This vendor's success will depend on training RPA developers, building a direct model, and managing growth. UiPath is one of the stronger RPA platforms, geared for independent-minded partners and customers.

- › **Automation Anywhere delivers an enterprise-grade digital workforce platform.** Automation Anywhere evolved from desktop integration solutions, providing a strong RPA foundation. Its main verticals by revenue are banking and capital markets (33%), high-tech and telecom (15%), and healthcare and pharma (12%). Procure-to-pay, quote-to-cash, HR administration, claims processing, and other back-office processes represent the majority of use cases, balanced equally between direct and channel customers. Automation Anywhere's work is 80% back-office and 20% front-office. It has one of the largest trained partner ecosystems, with more 150 in R&D staff and more than 1,000 customers. It has extensive internal support staff, distributed across the US, India, the UK, Australia, Singapore, Germany, and Japan. Based on Forrester inquiries and a self-reported 396 new customer wins in 2017, Automation Anywhere has momentum.

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Basic bots are easy to build and require strict enterprise control to avoid governance issues. More-advanced use cases require skills such as XML or C#. Design usability will improve with model-based design, a road map item. Central control, deep scheduling, and trigger capabilities are key control-room features. Reporting overall is not as out-of-the-box (OOTB) as Forrester would like. For example, the platform captures extensive audit detail, but making it useful takes effort. IQ Bot — which reference customers have not yet deployed — will improve reporting. The product has improved. For example, AISense improves Citrix support with proprietary computer vision. IQ Bot's proprietary text analytics is well timed for trending unstructured use cases. An API gateway with more than 200 connections is available, but it needs easier integration to third-party assets such as authorization and vaulting tools, SSO, or code deployment platforms. This vendor is ahead in providing a bot store for partners; for example, a solution partner trains IQ Bot on a specific set of documents and releases the bot to the store. Customers often select Automation Anywhere for overall ease; duration; and cost of deployment, with an average selling price between \$50,000 and \$150,000. This vendor's solution is one of the elite products in the field.

- › **Blue Prism offers secure, scalable, and central control.** A group of process automation experts formed Blue Prism, one of the few public RPA companies, in 2001. Revenue has more than doubled since our 2017 evaluation and now exceeds £25 million, with 90% from license fees. Responding to investment by peers, the company raised £70 million in 2017 through stock distribution. Business grew from 124 to 448 customers in 2017, with high upsell percentages. Training partner developers was a major 2017 effort. Blue Prism takes certification seriously, and it's the only provider in our evaluation to use an accredited third party. Analytics has taken the megacloud direction; for example, it has an integration with Google's ML workflow viewed from Blue Prism's process designer.

Version 6.2 addressed soft spots from our 2017 evaluation. Attended use cases are now in scope with integration with Trust Portals, but overall, human-initiated bot activity isn't this vendor's strongest area. It has augmented Citrix and virtual desktop infrastructure (VDI) integration with published reference architectures and client experience. The design studio, like many in the field, leans IT- and programmer-heavy, but an improved drag-and-drop for design UI shows promise. In addition, the control-room environment would benefit from easier setup and a more intuitive feel. The object-oriented approach provides the strongest structure for reusability of components, but more OOTB bots for environments like SAP would be a plus. Customers would also welcome improved bot deployment efficiency to minimize license and resource requirements and reduce customization. Blue Prism is addressing a previous issue with partitioning to build applications for use in several departments in the upcoming 6.3 release. Some basic features like record-and-play are still not in the portfolio, but Blue Prism continues as one of the top platforms. Security, encryption where it counts, and overall stability make this provider a safe bet. Reference customers state that the overall approach is more robust for ongoing changes required to meet modernization road maps. Those firms looking for evidence of real-life success in financial services, particularly for fraud, anti-money laundering, and audit for unattended use cases, will continue to shortlist Blue Prism.

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**Strong Performers**

- › **WorkFusion remains focused on human/machine collaboration.** Most of the RPA field began with a narrow and simple automation focus, but WorkFusion started out building ML-based automation. Headquartered in New York and now seven years old, it turned to RPA in 2014. Regulated industries and large financial service firms make up 50% of its revenue. Since our 2017 evaluation, WorkFusion has doubled its staff to 350, and customers are now up to 250. It has closed another round of financing that now totals \$120 million. It's 90% direct, with only 10% through partners selected for their more advanced automation and global scale. Targets for WorkFusion have been large domestic US enterprises with revenue over a billion dollars. This company maintains a high average selling price compared with the rest of the field.

WorkFusion focuses on unattended use cases that are operationally rich, with attended use cases secondary. Making AI self-service for businesspeople is a primary focus. This vendor believes that enterprises don't want data and analytics based in megaclouds but prefer targeted internal data sets. It delivers preloaded algorithms for data extraction, classification, unstructured decisions, and predictions tuned to select use cases. This is unique in the RPA field. The approach speeds deployment but also minimizes learning and infrastructure requirements. Other patterns initiate automation via files, databases, and schedulers, accepting input variables for REST services to trigger a process. Mainstream desktop automation such as recording features, application control, and bot design are only average. The design studio needs to be simpler, with better communication between automations and control tower for proactive monitoring. As a future direction, WorkFusion represents a viable path for analytics-based RPA automation and remains a progressive force in the market. It has launched a free desktop tool, embedded chatbots, and human workforce orchestration to handle automation exceptions. Leading enterprises will weigh WorkFusion's ML strength against more-basic RPA features.

- › **Pegasystems merges robots, analytics, and case management.** Enterprises are often not sure how RPA fits with other process tools. Pegasystems made this a bit clearer as the first BPM market participant of substance to purchase an RPA provider, OpenSpan. RPA is more of a spoke to Pegasystems than a hub. It surrounds a digital core that includes case management, real-time interaction management (RTIM), and various CRM solutions. A limited-use license for Pegasystems' case management product now comes with an RPA purchase. The RPA practice has diversified. While 80% of deals have attended bots, 38% of new deals have an unattended component. In 2017, this vendor provided blended support for large clients like Anthem, Bank of America, and Unum.

Pegasystems' strategy is straightforward: Provide quick value with RPA that requires minimal architecture, then follow with Workforce Intelligence (WFI), which may lead to BPM, case management, customer service apps, or more advanced analytics. WFI uses bots that listen to desktop activity and transmits results to an ML environment hosted in Amazon Web Services (AWS). Heat map reports can then guide automation. Bot design has a graphic interface suitable for a business analyst but does require programming knowledge, like loops, to design an optimal bot. It

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also has a more advanced developer environment that the vendor is moving from write scripts that still use Visual Basic constructs into its low-code digital process automation (DPA) environment. Analytics for surface automation, using OCR and computer vision, are behind the field, but rules matching and an attribute level “injection” UI interaction can identify changes in an application. OCR and image text analytics use cases to interpret unstructured documents (e.g., PDFs and image files) aren’t in its analytics sweet spot, but the vendor does offer native support for unstructured data analytics, including intent, sentiment, and text. Reporting needs to be easier and more OOTB. However, Pega’s native AI capabilities, predictive analytics, and chatbot direction track well with the RPA market direction. Pega is not the least expensive RPA product, but it has scale as well as depth for attended requirements and is backed by a smart and well-financed software company. It will continue to grow in the RPA market, particularly for enterprises using other Pegasystems digital transformation tools.

- › **NICE surrounds automation with analytics.** NICE started its robotic journey with the 2010 acquisition of Eglue and added queue management and scale features in 2014. In 2016, it separated RPA from the contact center workflow automation business to create focus. Today, it spans attended and unattended digital workloads, but most customers have valued its contact center depth. Most revenue still comes from preexisting customers, but it added 51 logos in 2017. Still largely direct, it did add select marquee integration partners such as Accenture BCG, Deloitte, and PwC.

The solution has strong central management to oversee queuing, process completion, and system livelihood. It meets strict security standards that include the basic ability to run behind a locked screen but has added features such as a connectivity watcher that monitors the object-level UI integration for application changes. Additionally, NICE added Automation Finder, which identifies automation opportunities using desktop analytics and machine learning. A new UI targeted at unattended automations is now in the field and improves usability. Smart recording (record and play) is available but doesn’t advance initial design. NICE has a wide analytics portfolio, including a chatbot, its own text analytics, and a Celaton partnership for invoice processing. Stronger connection and packaging with the RPA platform would be a win. Upgrades, browser support, and release management have improved as a standalone software unit. As a \$1 billion company with a 15-year track record of automation, NICE is a safe choice, particularly for attended use cases and existing customers.

- › **Kryon builds from contact center performance assessment.** Kryon’s Leo product, rebranded to Kryon RPA in Q1 2018, launched in 2012 in Israel. It raised \$12 million in venture capital in 2017 and over \$20 million in total. Kryon RPA builds from a modest customer base of 100 but has an expanding global footprint, with 50% of its revenue now from the US. Initially, it had a focus on performance assessment in contact centers, and the RPA passion started there; it now shows a 40% attended and 60% unattended pipeline. It offers a unified stack for attended and unattended design, merged after initial company growth in contact center automation.



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Bot design uses various scripting languages viewed as plug-ins, databases, and file system operations. The icon-based process view is used only to visualize the process, not for design. Bot deployment efficiency with intelligent queue management and hybrid support (combining attended and unattended support) are strong in the product. It has a Microsoft-based architecture with modest infrastructure requirements and limited requirements for third-party products (e.g., versioning, reporting, or credential management). Challenges result from a modest customer base and limited trained partners, despite strong OEM partners like Software AG and Verint. Its analytics road map is strong, but it has fewer production credentials than its peers. Progress is evident for unstructured content use cases, with a strong ABBYY integration. It uses patented computer vision for application location, support for Citrix sessions, and desktop recording. Its road map combines process metadata with desktop sequencing (RPA desktop analytics) with deep learning for process analytics. Kryon is a strong and complete solution with a good price point relative to leading platforms. It's a premier OEM partner for embedded RPA.

- › **Kofax shifts focus to software robotics.** Kofax acquired Kapow in 2012 for its content migration smarts but soon found the real jewel: a robotic engine that drives web APIs that gather and process data from internal and external sites. Private equity investment from Thoma Bravo, strong cash flow from the mature capture and DPA market, and more than 600 RPA customers as well as more than 20,000 document-related customers worldwide allow it to focus on the rapidly advancing robotics market. Major deals with the Bank of Tokyo have given Kofax a foothold in the lucrative Japanese market. The architecture is elegant. Customers can deploy and scale RoboServers using Docker containers, which is more cost-effective than more traditional RPA deployments using managed virtual machines. Each desktop contains only a small agent rather than a full RPA automation, which then connects to the management console to dispatch a stored automation. This keeps the footprint for each virtual environment to a minimum.

Improvement in desktop RPA features, such as Citrix support — with surface automation based on neural technology — is evident. The design studio supports a range of skills (e.g., programming APIs for bot integration with apps). But it has two environments within the design studio, each with its own visual design environment. The design captures process data from the target machine but doesn't operate on or depend on the target machine, a plus. Thick client support has improved but at times feels like an add-on feature, especially when dealing with debugging. The platform needs improved integration between web/file capabilities and desktop capabilities. Robot reporting, insights, scheduling, version control, and trapping of robot errors also need to improve. Reusable components (robots, snippets and workflows) are stored in the management console in one common repository. Kofax was initially a good fit only for large-scale data pooling applications, but now finance and administration (F&A) and mainstream RPA is in play. 2017 saw it carve out a position in transportation and logistics, for example, with bots that move data among web portals, legacy systems, customers, and suppliers to solve scheduling and ordering issues. Improved core RPA features, stronger partnerships, and greater attended experience will move Kofax up the leaderboard. Any enterprise with Kofax-adjacent content products (e.g., capture and BPM) or that prefers execution-based rather than per-bot licensing should shortlist Kofax.

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- › **EdgeVerve brings a combined services and product approach.** EdgeVerve is a wholly owned subsidiary of tech giant Infosys. In January of 2013, EdgeVerve launched the AssistEdge product and now has 200-plus customers spread across banking, manufacturing, retail, telecom, and utilities. EdgeVerve blends services expertise with platform features. Frameworks for an automation center of excellence, RPA governance, and process discovery flank the product. There have been many product enhancements since 2017; the design studio now has drag-and-drop features, and users can record the desktop and transpose results into an automation script. Strong desktop analytics combines with proprietary process mining to provide automation insight. Improved surface automation allows bots to automate actions on complex documents such as dynamic PDFs. Customers tell us that the vendor needs stronger support for nonprogrammers and third-party application integration.

As we would expect from Infosys, a strong implementation team accelerates projects and lowers deployment costs. Since our 2017 evaluation, AssistEdge has more tightly integrated Nia, the Infosys AI platform, with business apps such as F&A, fraud, sourcing, and contract analysis. AssistEdge is best suited for companies that need services and product to drive successful RPA programs. EdgeVerve is moving quickly to reduce dependency on Infosys services.

- › **Thoughtonomy provides a SaaS-based platform for frictionless work.** Thoughtonomy believes that enterprises need an on-demand pool of digital labor provided via a software-as-a-service (SaaS) model. An orchestration layer dispatches bots for on-demand tasks, reducing bot idle time and enhancing deployment efficiency. The vendor surrounds the platform with strong support services and a relatively small but expanding set of partners. Based in the UK, it now has 203 clients, with first customers in 2014 and 80% hosted in its cloud and provided in a SaaS subscription. It uses OEM components for its design studios but has added value and plugged gaps with most differentiated platform elements. It includes AI capabilities within its platform, including NLP, analytics, chat, computer vision, and ML, that allow crisp packaging and pricing, but it needs to keep up with open source and cloud development.

Thoughtonomy is a strong fit for midsize enterprises (500 to 1,000 employees) that want a low commercial point of entry to start small and scale fast, supported with a cloud delivery model.

## Contenders

- › **Redwood Software blends RPA with a broader process focus.** Plugging inefficiencies in Oracle and SAP enterprise apps has been a full-time and successful effort for Redwood Software. It reduces manual labor in supply chain, logistics, forecasting, eCommerce delivery, and financial posting. Robot deployment times are reduced by a catalog of Oracle, SAP, and other automations but still not easily deployed without Redwood services. Redwood Software has an elegant architecture. A bot accepts external variables from a process to execute its routines. This results in a smaller set of centrally run robots with less concern for a physical desktop and reduces bot maintenance and infrastructure costs. The tradeoff? It will be quicker to get simple bots up and

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running with other platforms, but this approach enhances scale and agility. Stronger integration with SAP security models to control bot execution would advance a core direction of the company. In addition, desktop integration, VDI support, desktop analytics and other core RPA features are only average.

For its customers to get full value, Redwood Software asks more of them than other vendors do. Philosophically, it's more oriented to APIs (data integration) and less to a UI (desktop integration). Process Orchestrator, which controls bots, feels more like a BPM app that takes a broader process view. Its catalog of “best practice process design” robots — mostly for enterprise resource planning (ERP) — emphasizes its strength in F&A. Redwood Software is worth a good look for any serious F&A operation looking to robotize tasks.

- › **Contextor is an integrated development environment that targets agility.** Contextor is riding the RPA wave, having doubled its number of customers in the past six months. Half of these new customers are in France, but the rest are scattered in Germany, Eastern Europe, and the US. In 2017, Contextor had all direct sales, but it has expanded its partnerships. Enterprises deploy the Contextor solution as back- or front-office, including point-of-sales and branch-office use cases, but attended operations are the strongest fit. The robot design has improved and starts with a capture of objects (fields, attributes, and labels) directly from the application. This creates a library that customers can use for bot development. New to this evaluation is a graphical icon-based designer to build the wireframe for the bot and jumpstart initial design, but the developer often drops into JavaScript scripting to complete a macro. The approach adapts well to complex applications that may require specific business rules and features, such as file, FTP, Office, JavaScript, or NodeJS libraries.

Contextor is lighter than the rest of the field in analytics. It has progressed from attended-mode use cases where central control was secondary. This results in a less capable control tower than its peers offer, yet unattended capabilities are now evolving to meet central control and monitoring requirements with more resilience to back-end system changes. Desktop features like recording — not favorably viewed in France or Germany — are average compared with those of the competition. Contextor is most suited for advanced enterprises or integration partners leveraging the flexibility in attended use cases.

- › **Softomotive is for those that want to start small and get fast ROI.** Softomotive entered the automation market in 2005 (before RPA became a term in 2012) with a standalone “serverless” product called WinAutomation. In total, Softomotive has 7,000 customers, including both WinAutomation and its server-based RPA solution, ProcessRobot. ProcessRobot provides distributed enterprise features and a clean and smooth upgrade from standalone desktop versions. Its business is balanced geographically between the US and Europe and is 80% direct. But despite adding 75 consulting partners (42% Asia Pacific, 40% in the US, and the balance in Europe), its partnership network is behind those of other vendors. It has added offices in Bengaluru, India; Houston; New York; and the UK, with beefed-up development in Europe.

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Softomotive supports two robot deployment options: a “sidebot” run in attended operation and a “solobot” for unattended work run from a server. The design studio is easy to grasp; for example, users can drag actions for common loops and logic controls, and configuration screens are simple. Ease of deployment has led to traction against larger RPA platforms in some enterprise accounts looking for quick value. Scripting or programming languages are well hidden, but the vendor could improve support for more-advanced developers. It has integration with external tools but lacks integration with CyberArc. The large desktop customer base and partnership development should bode well for expansion. Overall, Softomotive is a strong choice for individual business users, small teams, and medium-sized enterprises, given its strong serverless desktop heritage. WinAutomation is a good option for companies that want to start small, get an immediate ROI, and scale to ProcessRobot. It also provides a good price point compared with the rest of the field.

- › **AntWorks builds from unstructured content.** AntWorks is a three-year-old company with 120 staff, mostly in Chennai, India. Its founders have a BPM background, and this shows in its RPA perspective. It has three separate products that work together. Computer vision attacks unstructured content with text analytics and improves on limitations of OCR for some use cases. RPA provides supporting automation, and a third product provides ML to drive decisions based on data and bot actions. The machine learning is fractal-based, which requires less training data than neural networks.

AntWorks has the tools to reduce bot maintenance and a dynamic recording process for desktop analytics. Emphasis on unstructured content use cases bode well for this approach. Reference customers were in the early stages, but experience with larger deployments and more RPA customers will strengthen the product. AntWorks is a bit late to the RPA party — but this may work in its favor.

- › **Another Monday takes a broader automation view.** Started in 2005 and providing automation solutions in Germany and Austria, Another Monday has roughly 100 employees. It provides digital workers as a managed service, with integration support for premier clients like Deutsche Telekom, Eon, and Vodafone. A major product release in early 2018 pushed Another Monday into the general RPA platform market. It emphasizes made-in-Germany quality with a tool box of capabilities, ranging from recording to learning and cockpit-driven command and control features, that are well suited for customized assembly rather than platform delivery. The designer provides flexibility and depth but doesn’t emphasize some RPA basics, such as recording and screen object inheritance. The platform depends too much on its own services and needs to develop build-your-own-bot approaches to advance further in the general market.

Another Monday believes that enterprises will end up with multiple RPA platforms. It will host other platforms alongside its own, a unique “open” position in the industry and one that speaks to a broader automation perspective. It’s open to partners that wish to white-label its platforms across several variations. Its capabilities approach allows tailoring (e.g., for specific GDPR requirements in Germany). A success-based remuneration scheme, where only successful bot runs get paid, is

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popular with reference customers. The best fit for Another Monday is a large firm, particularly in EMEA, that has line-of-business process problems such as onboarding and claim management and that needs customization to meet unique requirements.

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## Supplemental Material

### Online Resource

The online version of Figure 3 is an Excel-based vendor comparison tool that provides detailed product evaluations and customizable rankings. Click the link at the beginning of this report on Forrester.com to download the tool.

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**Data Sources Used In This Forrester Wave**

Forrester used a combination of three data sources to assess the strengths and weaknesses of each solution. We evaluated the vendors participating in this Forrester Wave, in part, using materials that they provided to us by May 11, 2018.

- › **Vendor surveys.** Forrester surveyed vendors on their capabilities as they relate to the evaluation criteria. Once we analyzed the completed vendor surveys, we conducted vendor calls where necessary to gather details of vendor qualifications.
- › **Product demos.** We asked vendors to conduct demonstrations of their products' functionality. We used findings from these product demos to validate details of each vendor's product capabilities.
- › **Customer reference surveys.** To validate product and vendor qualifications, Forrester conducted a survey with three of each vendor's current customers.

**The Forrester Wave Methodology**

We conduct primary research to develop a list of vendors that meet our criteria to be evaluated in this market. From that initial pool of vendors, we then narrow our final list. We choose these vendors based on: 1) product fit; 2) customer success; and 3) Forrester client demand. We eliminate vendors that have limited customer references and products that don't fit the scope of our evaluation.

After examining past research, user need assessments, and vendor and expert interviews, we develop the initial evaluation criteria. To evaluate the vendors and their products against our set of criteria, we gather details of product qualifications through a combination of lab evaluations, questionnaires, demos, and/or discussions with client references. We send evaluations to the vendors for their review, and we adjust the evaluations to provide the most accurate view of vendor offerings and strategies.

We set default weightings to reflect our analysis of the needs of large user companies — and/or other scenarios as outlined in the Forrester Wave evaluation — and then score the vendors based on a clearly defined scale. We intend these default weightings to serve only as a starting point and encourage readers to adapt the weightings to fit their individual needs through the Excel-based tool. The final scores generate the graphical depiction of the market based on current offering, strategy, and market presence. Forrester intends to update vendor evaluations regularly as product capabilities and vendor strategies evolve. For more information on the methodology that every Forrester Wave follows, please visit [The Forrester Wave™ Methodology Guide](#) on our website.

**Integrity Policy**

We conduct all our research, including Forrester Wave evaluations, in accordance with the [Integrity Policy](#) posted on our website.

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## Endnotes

- <sup>1</sup> See the Forrester report "[The Forrester Wave™: Robotic Process Automation, Q1 2017.](#)"
- <sup>2</sup> Single-tenant is an architecture where each company has its own instance of the software and supporting infrastructure. Each has the ability to change, customize, and manage its own environment, distinct from the others. Multitenant is an architecture where multiple companies (or departments within a company) share the same software instance to store their data. The shared instance is partitioned to specifically prevent access to each other's application configuration and data. Minor changes are possible, but customization comes at a higher cost.
- <sup>3</sup> For GDPR protection, in the server-based and headless unattended mode, some RPA platforms will show what's happening on the virtual screen without any user login. A locked screen should require a login with the proper user credentials.
- <sup>4</sup> Forrester has estimated the number of digital workers — robots — that will be deployed over the next five years. See the Forrester report "[The RPA Market Will Reach \\$2.9 Billion By 2021.](#)"

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