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Ovum Decision Matrix: Selecting a Robotic Process Automation (RPA) Platform, 2018–19

Competitive positioning and dynamics in a rapidly growing market

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Summary

Catalyst

RPA platforms represent a hyper growth market, with enterprises investing in new RPA platforms for process and task automation to achieve greater operating efficiency and agility, while allowing the human workforce to focus on more strategic and higher priority projects and tasks. Intelligent process automation (IPA) is in an early phase of its evolution and represents the next frontier for RPA vendors. This Ovum Decision Matrix (ODM) is a comprehensive evaluation to help enterprise IT and business leaders, including chief information officers (CIOs), enterprise and process architects, IT directors, line-of-business (LOB) leaders and process owners, and digital transformation leaders select an RPA platform that is well suited to their specific requirements.

Ovum view

Over the last couple of years, RPA has emerged as one of the priorities on business-IT agendas. If the current growth trends are anything to go by, RPA adoption will continue to accelerate, with more and more enterprises adopting RPA platforms for task and process automation. RPA as a technology discipline is evolving to support the automation of increasingly sophisticated processes (not just swivel-chair processes), and along with business process management suites (BPMS)/case management and artificial intelligence (AI)/machine learning (ML) capabilities, it forms a good combination for end-to-end process automation. RPA is not an entirely new approach to automation, but it would be naïve to think of current-generation RPA platforms as modular “screen-scraping” tools for basic task automation. Another argument in favor of the RPA value proposition is the increasing number of BPMS vendors that have partnered with RPA vendors, or even better, have integrated a partner’s RPA product into their own process automation suites.

We have seen enterprises implementing 5,000 to 35,000 software robots and achieving their key objectives for RPA, but there are cases where RPA was adopted without much thought or a clear strategy and enterprises have struggled to achieve any significant value. Throwing software robots at automation issues without a proper understanding of requirements or a clear strategy will fail to deliver any significant value. For larger implementations, enterprises must set up a center of excellence (COE) and have a proper governance framework in place to ensure that RPA initiatives remain on track and deliver business value.

RPA skills shortage, poor change management, lack of IT ownership, ill-defined success criteria, and disregard for infrastructure management considerations are some of the factors that have led to the failure of several RPA initiatives. RPA initiative leaders who do not spend enough time on analysis and optimization often think of RPA as a hammer and see most of the business processes as a nail to hit. This means that the automation of an inefficient business process with RPA will deliver only minimal gains.

A process-centric approach to robotic automation can overcome the limitations of traditional RPA products relying on user interface (UI) integration and can ensure a close alignment between the objectives for an RPA implementation and an enterprise's process automation strategy. In the end, the true value of RPA lies in its ability to function as an enabler to the automation of end-to-end

processes (though not necessarily 100% automation) and not just mimic an end user to perform specific tasks in a prescribed way.

This ODM presents the results of a comprehensive evaluation of key RPA platforms and vendors to guide enterprise IT and business leaders in selecting an RPA platform that is well suited to their specific requirements. While some vendors have evolved from their origins of screen-scraping and optical character recognition (OCR) tools, others are the BPM vendors that have acquired RPA or process integration/automation vendors to develop a broader enterprise process automation proposition. We have evaluated the product orientation (not service orientation) of key RPA vendors, including how they align with the broader enterprise process automation objectives.

RPA platforms represent a rapidly evolving and highly competitive market, with billions of dollars in venture capital (VC) and institutional and public funding pumped into rapid product development and aggressive sales, marketing, and geographic expansion initiatives. Accordingly, the competitive positioning of vendors included in this ODM is very likely to change over the next 12 months. Enterprise IT leaders should consult this ODM to shortlist appropriate RPA platform vendors for a request for proposal (RFP) and subsequent proof-of-concept (POC) evaluation.

Key findings

- RPA adoption in many enterprises starts as a tactical initiative, and once that substantial results have been achieved and users are conversant with key features and capabilities, the use of an RPA platform is expanded to a wider range of use cases.
- RPA hype is at its peak and many enterprises are continuing to struggle to progress with their RPA initiatives, at times taking months to conclude POCs and subsequently realizing less value than they had expected from RPA implementations.
- Contrary to popular belief, not many enterprises have a clear upfront strategy for using RPA and BPMS in combination for end-to-end process automation. Specialized RPA and major BPMS vendors dominate this market, even though their evolution and routes to the current state of RPA products are quite different.
- RPA platform vendors have invested in improving key features and capabilities, including user experience (UX), user productivity tools, cloud deployment, hybrid automation, component-level APIs, BPMS/case management integration, process discovery, process analytics, and AI/ML capabilities for improving OCR and image processing, and continuous process optimization.
- Most RPA platform vendors have integrations with several commercial and open source AI/ML products to deliver an IPA proposition. Only a few vendors have developed dedicated AI intellectual property to deliver superior IPA capabilities. This is an area for improvement for most RPA platform vendors. With core RPA features and capabilities expected to be commoditized over the next two to three years, IPA capabilities have emerged as a key source of competitive differentiation for RPA platform vendors.
- In terms of monetization, marketplaces and software robot stores, robot-as-a-service (RaaS) delivery under a managed services model, and packed RPA platform-as-a-service (PaaS) available under a software-as-a-service (SaaS) pricing model are the key approaches adopted by several RPA platform vendors.

- Leading RPA platform vendors provide comprehensive capabilities for supporting attended and unattended automations. Several RPA vendors are supporting or are working toward supporting hybrid automation where human and virtual workforces share work and pass tasks to one another.

RPA platform and vendor selection

Inclusion criteria

Ovum has closely tracked the emerging RPA platform vendor landscape over the last two years and we have used these observations as the baseline for inclusion/exclusion in this ODM. The criteria for inclusion of an RPA platform and vendor in this ODM are as follows:

- The RPA platform should deliver significant capabilities across three of the four technology assessment criteria groups: “development features and UX”, “automation and execution capabilities”, “security, monitoring, and governance”, and “AI capabilities”.
- The software product must enable task and process automation and its features and capabilities should not be limited to a subset (for example, just OCR capabilities).
- There is substantial evidence that the vendor is interested in pursuing a progressive product strategy that helps ascertain product viability and applicability to a range of process and task automation use cases.
- The RPA platform should have been generally available as of June 2017. The vendor must have at least 50 enterprise (paid) customers using its RPA platform, but the customer base should not be restricted to a few specific regions, with only minimal customers present in other regions.
- It should deliver enterprise-grade security, governance, and monitoring capabilities and an appropriate UX for less-skilled users (non-developers). The core RPA product should be architecturally coherent and provide product/component APIs.

Exclusion criteria

An RPA platform/vendor is not included in this ODM if:

- The core RPA capabilities provided by the vendor are restricted to an average level of task automation or a significant share of RPA capabilities (not applicable for integration with AL/ML products) are delivered in partnership with other vendors. For this reason, specialized AI automation vendors that do not offer any substantial capabilities for process automation use cases were excluded from this ODM.
- The vendor caters to the requirements of just a few use cases and does not really offer an enterprise RPA platform with a coherent architecture and good level of integration between various software components.
- The vendor is unable to commit the required time and resources for the development of research to be included in this ODM. Some vendors, which would otherwise qualify for inclusion in this ODM, opted out of the evaluation exercise and were unable to submit the required level of information in response to the evaluation criteria spreadsheet by the cut-off

date (August 30, 2018). WorkFusion opted not to participate after receiving an ODM questionnaire, without citing any specific reason.

- The vendor has more service orientation than product orientation, and there is not enough evidence that it is interested in expanding the platform's features and capabilities to cater for the requirements of emerging use cases and exploiting new market trends. There are indications that the vendor is struggling to grow its business or defend its position in the market.
- The vendor did not feature in any of the analyst enquiries from Ovum customers (for example, enterprise IT leaders and users), and/or there were other indicators for a lack of investment and a dedicated RPA strategy.

Ovum ratings

Market leader

This category represents a leading RPA platform that Ovum believes is worthy of a place on most technology selection shortlists. The vendor has established a commanding market position with its RPA platform, demonstrating a high level of maturity, cohesiveness, innovation and enterprise fit, and the capability to meet the requirements of a wide range of use cases. Leaders have executed an aggressive product roadmap and commercial strategy to drive enterprise adoption and rapid business growth.

Market challenger

The vendors included in the upper half of the "challengers" section **(Kofax, Kryon, and Softomotive)** are "strong performers" in terms of technology assessment scores and would otherwise qualify as leaders if only the technology assessment were to be considered. However, these vendors did not achieve consistently high scores for the execution and market impact dimension, an essential requirement for achieving a market leader rating.

An RPA platform in this category has a good market position, offers competitive technical functionality and a good price/performance proposition, and should be considered as part of the technology selection. Vendors in this category have established a substantial customer base, with their RPA platform demonstrating a good level of maturity and catering for the requirements of a range of process and task automation use cases, as well as continuing to execute a progressive product and commercial strategy.

Market follower

An RPA platform in this category is typically aimed at specific task automation use cases and/or customer segment(s) and can be explored as part of the technology selection. It can deliver the requisite features and capabilities at reasonable pricing for specific use cases/requirements. This ODM does not feature any vendor in this category.

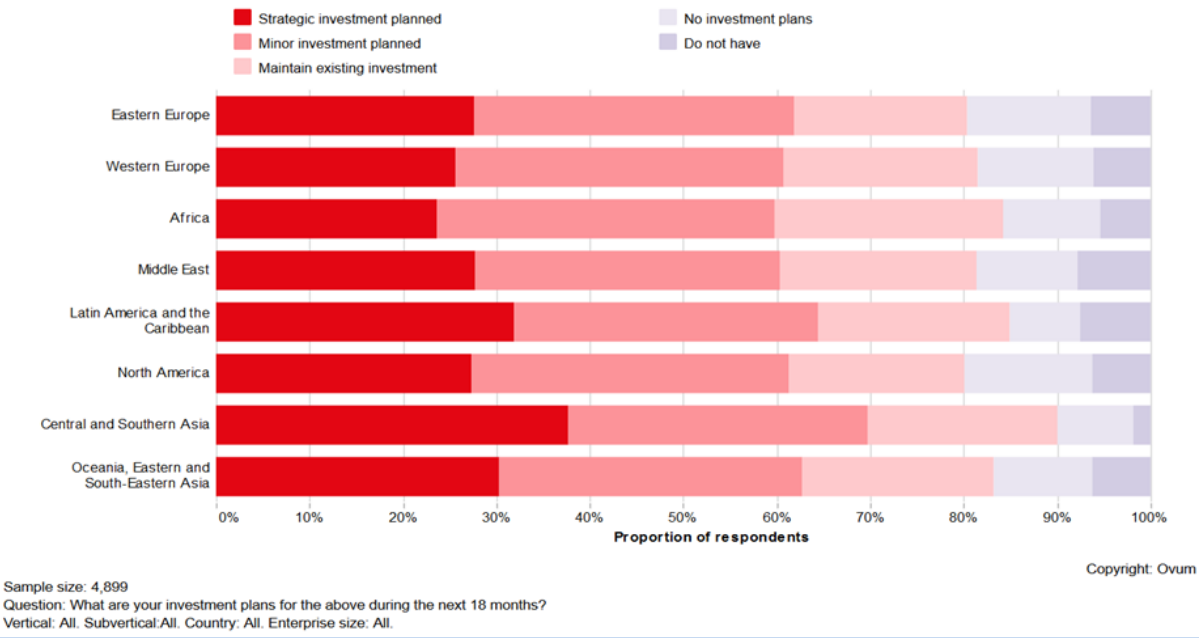
Market and solution analysis

RPA platforms have entered the mainstream and adoption is growing at a rapid rate

Ovum ICT Enterprise Insights 2018 survey results (see Figure 1) indicate that RPA adoption in Asia-Pacific, Latin America, and Europe will accelerate over the next 18 months. RPA software spending in North America will continue to grow at a rapid rate, albeit over a higher relative base. Another interesting survey result indicated that only about 17% of respondent enterprises do not have an RPA platform or have no plans for investment in an RPA platform.

A closer look reveals that over the last couple of years, leading RPA vendor revenues have grown by several multiples. As part of our research for this ODM, we identified successful RPA implementations involving between 5,000 and 35,000 software robots. While the number of large enterprises implementing RPA initiatives at a significant scale is higher in comparison to midsize enterprises, we expect the availability of RPA software as a PaaS product and flexible pricing models to drive rapid adoption in the second category of enterprises.

Figure 1: Enterprises inclination for investment in RPA solutions, 2018–2019



Source: Ovum ICT Enterprise Insights survey 2018-19

In simple terms, RPA software can be considered a toolkit to enable the rapid configuration and subsequent management of software robots for the automation of rules-driven structured processes ("if this, then that"-style process execution, for example). The process/task automation aspect of RPA can be thought of as presentation-layer automation software that mimicks the steps of a rules-driven structured process to perform "prescribed" functions in a scalable way. RPA can enable 24x7 execution of rules-driven structured processes at a fraction of the cost associated with human counterparts.

AI capabilities are not intrinsic to an RPA platform, and enterprises should not think of these as core capabilities provided by an RPA platform. Just like other classes of enterprise software products, AI capabilities drive great ease of use and user productivity for an enterprise RPA platform. This is similar in to the way in which AI/ML capabilities are used in an integration PaaS (iPaaS) solution to offer suggestions to automate a significant part of an integration flow development.

Vendor marketing and the views of some industry pundits have created confusion in the market, with a lack of understanding in terms of how an enterprise RPA platform is different from previous-generation OCR tools, and the limitations of robotic desktop automation (RDA) and RPA from the perspective of end-to-end process automation. There is also a lot of noise around IPA and how integration with AI/ML capabilities provided by non-RPA vendors is completely changing the applicability to a range of use cases. In reality, only a few vendors have dedicated AI/ML IP, and IPA itself is at an early stage in its evolution. In this context, enterprises would benefit by asking about what is under the hoods and how the pricing/licensing for AI/ML capabilities works for different use-case scenarios.

A modular and cohesive architecture, component- and platform-level APIs, enterprise-grade security and governance, dedicated environments for development and management of robots and automations, bot lifecycle management, pre-built reusable components for development, dedicated environment/tool for monitoring, and visibility into bot operations and automation executions are some of the core capabilities of an enterprise RPA platform.

The first wave of RPA adoption was driven by the need to reduce the costs and errors associated with the involvement of humans in mundane, repetitive tasks in service centers or back-office functions. RPA enables the execution of a large number of tasks in a highly predictable way, and in case of an increase in the number of tasks, enterprises have the option of deploying additional robots. From a process perspective, RPA is suitable for structured and semi-structured processes involving:

- high-volume transactions
- workflow enablement
- multiple systems or dual data entry
- searching, collation or information updates
- data matching or comparison
- simple or less-complex decisions that can be handled via a rules engine and/or algorithm (no judgement call necessary)
- repeatable and rules-based processes.

Other factors impacting process suitability to RPA include:

- highly regulated activities
- compliance and audit-related activities
- data sensitivity
- fluctuating volumes.

A combination of an RPA platform and BPMS can significantly accelerate process automation. RPA is a non-invasive approach to automation that does not require changes in legacy IT applications/systems. In terms of using an RPA platform and a BPMS in combination, specific sub-

processes (tasks) of an end-to-end process can be automated via software robots and control can then be passed to the BPMS if there is a need for decision-making (case management). The BPMS can provide a connector for integration with an RPA platform, enabling RPA involvement to be triggered from within the BPMS's workflow. Exceptions in the execution of sub-processes via RPA can be handled by the BPMS as an actionable activity. Below is a simple use case involving a “BPMS and RPA” combination:

Use case: handling a customer request submitted via email.

- An email with a specific customer request is intercepted by the RPA platform that applies logic to determine subsequent action.
- Depending on the requirements specified in the request, the RPA platform passes the case onto BPMS for case management.
- Knowledge workers add information and required actions to the case and forward this to the RPA platform.
- The subsequent back-office actions are processed by the RPA platform. This increases the overall efficiency of the customer request-handling process, and reduces the amount of human involvement required for processing the request to completion.

Enterprises interested in using an RPA platform must not simply jump to total cost of ownership calculations after a proof-of-concept evaluation. We advise enterprise decision-makers to factor in costs other than the cost of implementing hardware and software for RPA (as applicable, depends on the deployment model and can vary from vendor to vendor), including the following:

- monitoring costs such as tools for proper operation of robots and performance analysis for driving further improvement.
- development/support/maintenance costs for RPA software.
- upgrades and testing costs, such as software upgrades for adding new features and testing for proper functioning.
- infrastructure management costs, including disaster recovery (DR).
- costs of virtual machine (VM) and desktop/software licenses (for example, Microsoft Office).

We estimate that services spend on RPA implementations can range between 5x and 10x of the software licensing/subscription costs, but despite this level of spending, several RPA implementations fail to scale and/or deliver only minimal value. This is not a healthy sign for an automation software product that is aiming to drive user productivity and is often sold on the promise of substantial cost savings. Enterprises should be wary of vendors' sales claims for conducting POCs within a few days, because business processes in the real world are complex enough to warrant POCs running from a few weeks to months.

A close look at enterprise RPA platform adoption indicates that the split between unattended versus attended automation is tilted toward the latter, and likewise, RPA platforms are used more for the automation of back-office processes. Some RPA vendors, however, are focusing on improving automation for front-office processes. In the near-term, we expect to see an increase in RPA implementations involving attended automation.

RPA hype is at its peak and vendor marketing spend is following a similar trend. It is therefore important for enterprises to conduct a thorough POC and have a clear plan for how to best leverage

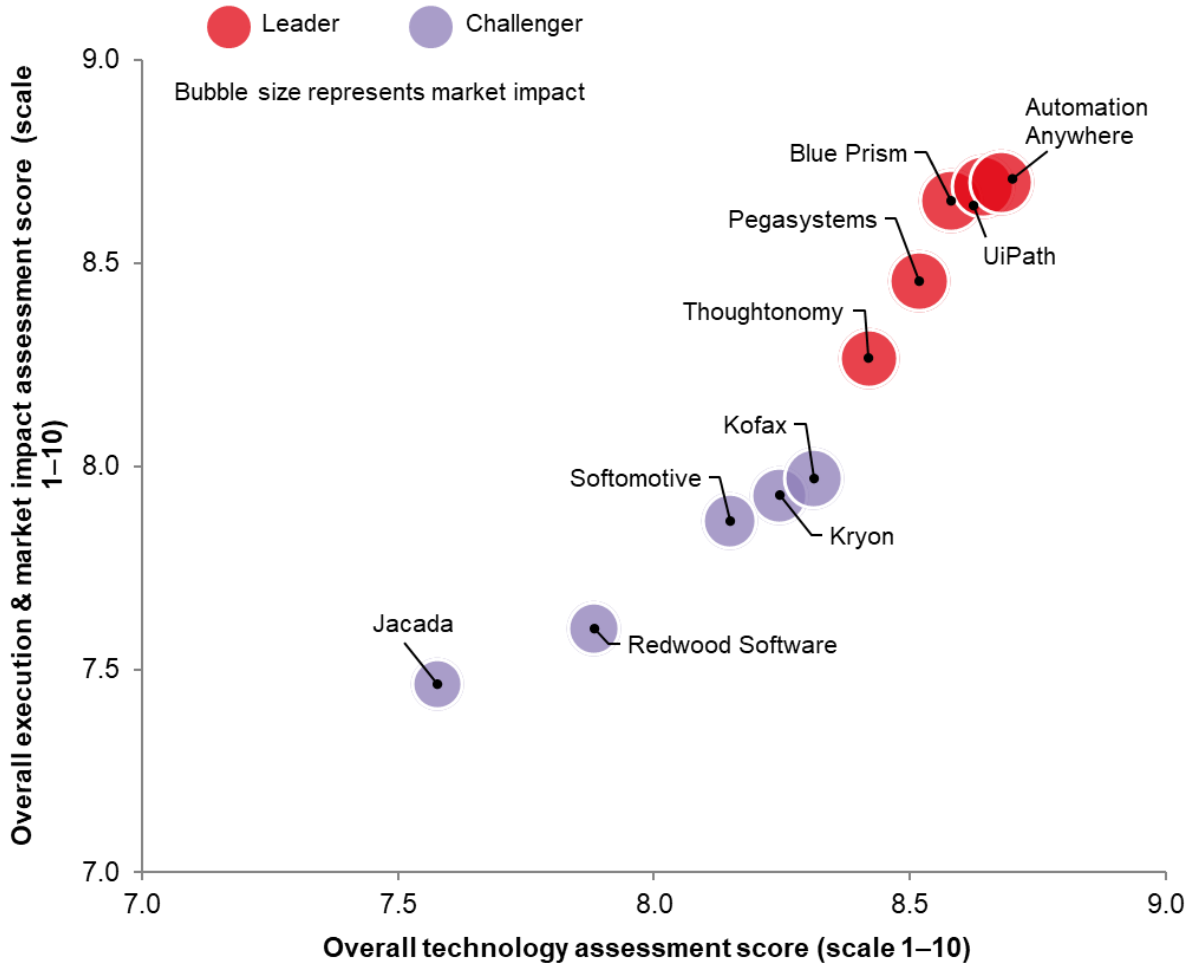
RPA for task and process automation. It is equally important to verify claims of SI/professional services providers that might have a conflict of interest owing to their strategic (deep) partnerships with specific RPA platform vendors. Lastly, enterprise decision-makers should focus on developing a holistic process automation strategy and not look at RPA platforms as just "band-aids" to provide a low-cost solution for automation issues.

Because RPA platforms are modular software products, vendor lock-in in most cases is not seen as major an issue as was the case with traditional on-premise software products. We already see a wave of implementations by enterprises that did not have a "first time right" RPA implementation and have switched to a new RPA platform provider better suited to their specific requirements. In 2019, we expect major BPMS vendors providing RPA solutions to target end-to-end process automation and IPA opportunities. For enterprise IT leaders, it is time to divert from BPMS versus RPA arguments and instead think about developing a holistic strategy for end-to-end process automation.

Ovum Decision Matrix: RPA Platforms, 2018–19

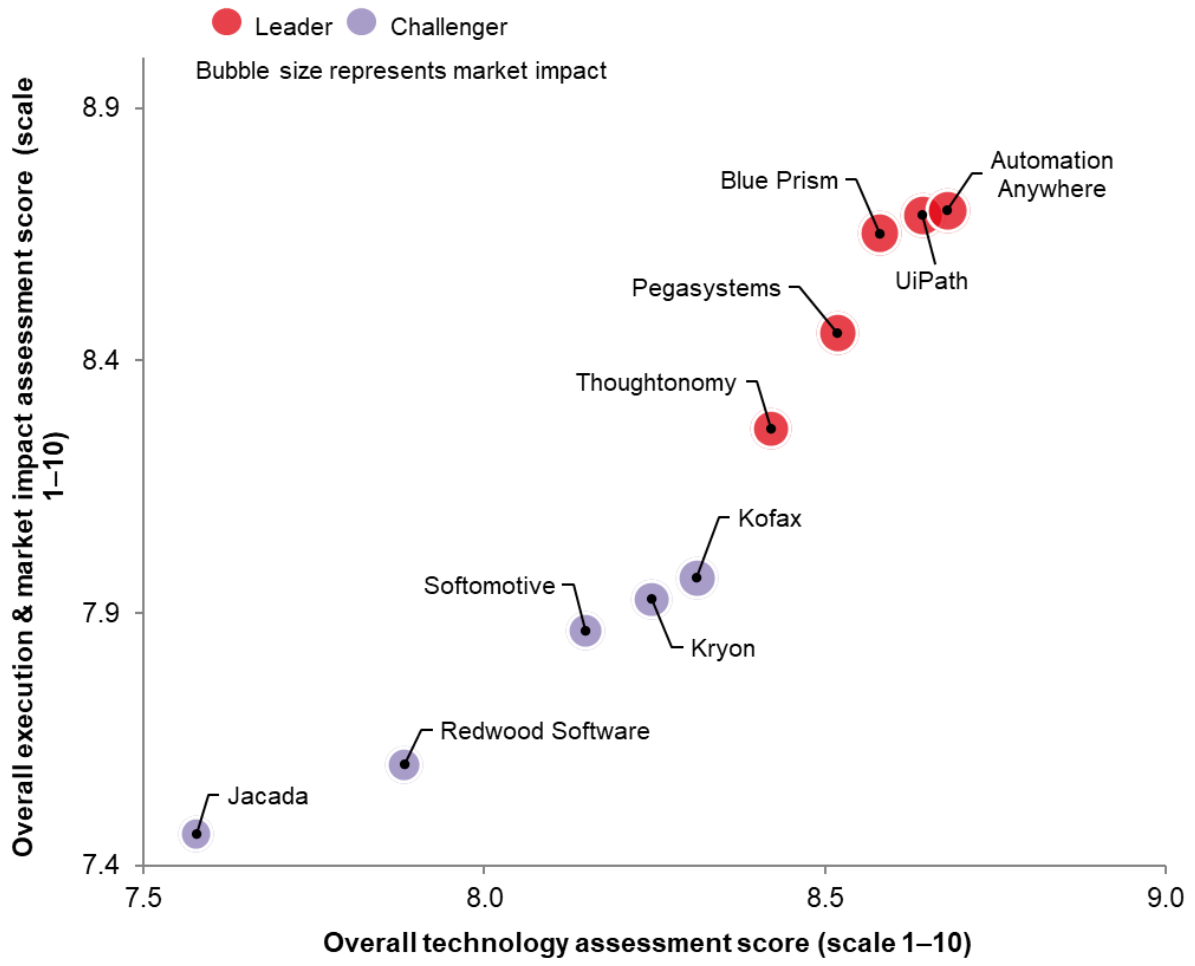
The ODM charts in Figure 2 and Figure 3 represent the results of a comprehensive evaluation of 10 RPA platforms and vendors meeting the inclusion criteria. Weightings for individual criteria groups under the "technology" and "execution and market impact" assessment dimensions are provided under the methodology section. We have provided an expanded view of the ODM chart (Figure 3) to magnify the competitive positioning of RPA vendors with small differences in the scores for two assessment dimensions. Table 1 provides a list of market leaders and challengers in alphabetical order (not in terms of scores), and subsequent sections follow this practice.

Figure 2: Ovum Decision Matrix: RPA Platforms, 2018–19



Source: Ovum (competitive positioning valid as of September 30, 2018)

Figure 3: Expanded view of Ovum Decision Matrix: RPA Platforms, 2018–19



Source: Ovum (competitive positioning valid as of September 30, 2018)

Table 1: Ovum Decision Matrix: RPA platforms, 2018–19

Market leaders	Market challengers	Market followers
Automation Anywhere	Jacada	-
Blue Prism	Kofax	-
Pegasystems	Kryon	-
Thoughtonomy	Redwood Software	-
UiPath	Softomotive	-

Source: Ovum

Market leaders: Automation Anywhere, Blue Prism, Pegasystems, Thoughtonomy, and UiPath

Automation Anywhere was originally founded as Tethys Solutions in 2003 and re-branded to its current form in 2010. It is headquartered in San Jose, California. Automation Anywhere is a leading RPA platform vendor with an extensive partner network spread across the globe. It has a strong product roadmap and the financial muscle to execute its growth strategy. Automation Anywhere has implemented DevOps improvements on the server-side architecture to exploit a microservices architectural approach. Adoption of IQ Bot, its product for IPA, has grown at a rapid rate. Automation Anywhere has so far secured $550m in external funding.

Blue Prism was founded in 2001 and is headquartered in Newton-le-Willows, United Kingdom. As a leading RPA platform vendor, it has registered rapid growth and was the first specialized vendor to trade on public markets, with an initial public offering (IPO) in March 2016. Blue Prism offers an API-rich platform and recently introduced the Blue Prism Digital Exchange (DX), which provides access to a range of AI, ML, analytics, OCR, and other capabilities. Blue Prism has certified reference architectures for major IaaS providers (Microsoft, Amazon, Google, and IBM), with resilient and elastically scalable topologies.

Pegasystems was founded in 1983 and is headquartered in Cambridge, Massachusetts. Revenue for FY 2017 was $841m, with cloud revenue growing at 25% on a year-on-year (YoY) basis. Pega Robotic Automation offers a framework for end-to-end process automation by combining RPA (attended and unattended), BPM, dynamic case management, AI, and desktop process analytics. It is uniquely positioned in the market for supporting end-to-end process automation initiatives in large enterprises pursuing scalable RPA implementation as part of the broader enterprise process management/automation strategy.

As the first vendor to offer a true RPA cloud product and then substantial AI enhancements, Thoughtonomy has developed a sound architectural and product foundation. Thoughtonomy supports both unattended and attended automations. In terms of AI capabilities, there is support for OCR through computer vision and governed learning to support variations in received documents or images. In addition to large enterprises, midsize enterprises interested in a low-cost entry to RPA and in pursuing a “start small and grow big” approach should consider Thoughtonomy. Thoughtonomy was founded in 2013 and has its headquarters in London, United Kingdom.

UiPath, a leading RPA platform vendor, has registered phenomenal growth over the last couple of years and has so far secured external funding of $448m, with a recent Series C funding round raising $225m at a valuation of $3bn. Computer vision (including Citrix automation), simplified automation development based on Microsoft Workflow foundation, orchestrator multitenancy, and support for high-density robotics are noteworthy features of the UiPath RPA platform. A significant share of UiPath’s customer base is using AI-enabled software robots that handle unstructured data to drive robot actions. It was formed in 2015 and is headquartered in New York. Its predecessor, Deskover was founded in 2005.

Market challengers: Jacada, Kofax, Kryon, Redwood Software, Softomotive

Jacada, founded in 1990, has its headquarters in Atlanta, Georgia. Jacada specializes in customer service RPA and supports both attended and unattended automation modes. Its expertise and IP are primarily applied to attended automation use cases that involve front-office processes or more specifically, customer service operations. Jacada's design paradigm supports the "build-once-and-use-anywhere" methodology, where an automation process designed for a specific channel (mobile, web, or phone) can be used by any other channel.

Kofax was founded in 1985 and has headquarters in Irvine, California. Kofax's strategy is to use RPA as a gateway to a much larger IA market and upsell/cross-sell to its 20,000 or so customers. Kofax RPA has a sound architectural foundation and Kofax software robots can be exposed to other workflow systems and processes via synthetic APIs. Kofax RPA supports screen automation for recognizing objects based on computer vision ML capabilities. Kofax is a leading vendor in the document capture market, pairing OCR with machine learning to enhance the degree to which information can be extracted from documents.

Kryon (erstwhile Kryon Systems) achieved the highest score for the AI capabilities criteria group under the technology assessment dimension. It has patented AI visual and deep learning technologies. Its RPA platform supports unattended, attended, and hybrid automation, and a key feature is a web-based management console for the real-time monitoring of a virtual workforce. Kryon offers a comprehensive approach to process discovery, identifying processes, providing automation recommendations, and enabling subsequent development of automation workflows. It was founded in 2009 and its North America headquarters are in New York.

Redwood Software was founded in 1993 and is headquartered in Houten, Netherlands. It has a wealth of process knowledge and 25 years' experience in the process automation market. Redwood Software's experience in the enterprise resource planning (ERP) segment and the pre-built catalog of robots are well received by enterprise customers. Redwood offers a unique license model where there is no limitation with respect to computing capacity, with customers only paying for the automation they use in a production environment, be it on-premises or in the cloud. It is actively working on developing an intelligent robot catalog that will include ML capabilities.

Softomotive offers both serverless (WinAutomation) and server-based RPA (ProcessRobot) solutions. A major share of its customers tends to start with WinAutomation to achieve quick ROI and then scale to ProcessRobot. Softomotive supports both attended and unattended automations and offers attractive pricing models, including per-software robot, per-user, and annual SaaS-based pricing. AI services from Microsoft, Google, and IBM Watson are included for enabling smart automation. It provides more than 300 pre-built actions/activities that can be used as building blocks for developing processes with custom user libraries. Softomotive was found in 2005 and recently relocated its base to the UK after a Series A financing round of $25m.

Market leaders

Market leaders: technology

Table 2: Ovum Decision Matrix: RPA platforms, 2018–19 market leaders: Technology

Criteria group	Vendor	Score
Development features and UX	UiPath	9.10
	Automation Anywhere	9.06
	Blue Prism	9.00
	Pegasystems	8.84
Automation & execution capabilities	UiPath	9.20
	Automation Anywhere	9.18
	Blue Prism	9.04
	Pegasystems	9.00
Security, monitoring, and governance	Automation Anywhere	9.06
	UiPath	9.00
	Blue Prism	8.96
	Pegasystems and Thoughtonomy	8.84
AI capabilities	Kryon	6.50
	Pegasystems	6.40
	Automation Anywhere	6.30
	UiPath and Blue Prism	6.20

Source: Ovum

Table 2 shows the vendors with top-four scores (on a scale of 1–10, including those with the same scores) for each criteria group under the technology assessment dimension. While the difference between highest and fourth highest scores for the development features and UX criteria group was 0.26, the corresponding difference for the automation & execution capabilities criteria group was only 0.20.

For the security, monitoring, and governance criteria group, the difference between the highest and fourth highest scores was 0.22. The difference between highest and fourth highest scores for the AI capabilities criteria group was 0.3.

Automation Anywhere, UiPath, Blue Prism, and Pegasystems are among the vendors achieving top-four scores across each criteria group under the technology assessment dimension. Thoughtonomy achieved a top-four score for one criteria groups under the technology assessment dimension. Kryon achieved the highest score for one criteria group (AI capabilities) under the technology assessment dimension.

Market leaders: execution and market impact

Table 3: Ovum Decision Matrix: RPA platforms, 2018–19 market leaders: Execution and market impact

Criteria group	Vendor	Score
Product maturity & innovation	Automation Anywhere, Blue Prism, and UiPath	8.75
	Pegasystems	8.50
	Thoughtonomy and Kryon	8.25
Scalability & enterprise fit	Automation Anywhere, UiPath, and Blue Prism	8.50
	Pegasystems	8.40
	Thoughtonomy	8.30
Product & go-to-market (GTM) strategies	Automation Anywhere	8.60
	UiPath and Blue Prism	8.50
	Pegasystems	8.40
Market impact	UiPath	9.35
	Automation Anywhere	9.20
	Blue Prism	9.10

Source: Ovum

Table 3 shows the vendors with top-three scores (on a scale of 1–10, including those with the same scores) for four criteria groups under the execution and market impact assessment dimension. Automation Anywhere, Blue Prism, and UiPath achieved the highest score for the “product maturity & innovation” criteria group. Pegasystems achieved the second highest score, while Thoughtonomy and

Kryon achieved the joint third highest score for this criteria group. The difference between the highest and third highest scores for this criteria group was 0.5.

Automation Anywhere, UiPath, and Blue Prism achieved the highest scores for the scalability and enterprise fit criteria group. Pegasystems achieved the second highest score, while Thoughtonomy achieved the third highest score. The difference between the highest and third highest scores for this criteria group was just 0.2.

Automation Anywhere achieved the highest score for the product and GTM strategies criteria group, followed by UiPath and Blue Prism with the second highest score. Pegasystems achieving the third highest score for this criteria group. UiPath achieved the highest score for the market impact criteria group, followed by Automation Anywhere and Blue Prism achieving the second and third highest scores, respectively. Leading RPA vendors in this ODM featured multiple times across four criteria groups under the execution and market impact assessment dimension.

Vendor analysis

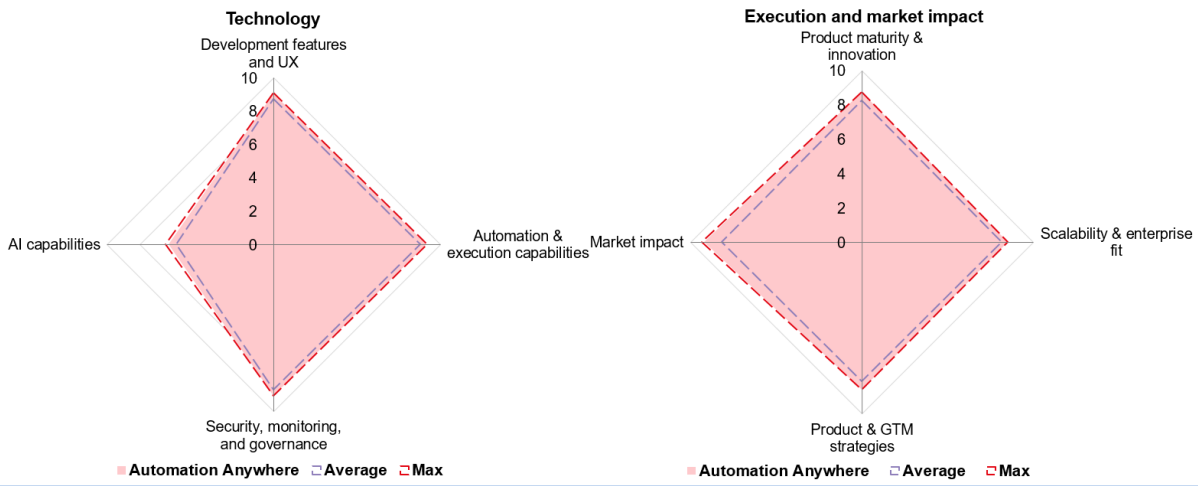
Automation Anywhere (Ovum recommendation: Leader)

Table 4: RPA products and/or architectural components evaluated, Automation Anywhere

Automation Anywhere Enterprise	RPA Base Platform (version 11)
IQ Bot	Cognitive Engine (version 6.0)
Bot Insight	Reporting and analytics engine
Bot Farm	-
Bot Store	Bot Marketplace

Source: Automation Anywhere

Figure 4: Automation Anywhere radar diagrams



Source: Ovum

Ovum SWOT assessment

Strengths

A leading RPA vendor running ahead with a well-rounded offering and aggressive strategy and execution

Automation Anywhere consistently achieved high scores (the highest or second highest score) for various evaluation criteria groups under the technology assessment dimension and has executed well against an aggressive product strategy. One of the understated aspects of Automation Anywhere RPA implementations is a relatively higher level of customer engagement and support provided via customer success managers (CSMs) that is one of the reasons for Automation Anywhere's high customer retention rate. Having secured Series A funding of $250m at a valuation of $1.8bn in July 2018 and $300m at a valuation of $2.6bn in November 2018, Automation Anywhere has the financial muscle to continue investing in product development, sales and marketing, and geographic expansion to maintain its position in a highly competitive market. Inputs gathered from customer references indicate a good degree of alignment between Automation Anywhere's RPA proposition and customer requirements. It is investing in product development across a range of capabilities, including process discovery, process analytics, business user enablement, support for greater horizontal and vertical scalability, and AI-led enhancements for driving user productivity.

Adoption of IQ Bot, branded as a cognitive automation product, has grown at a rapid rate and is used by a significant share of Automation Anywhere's existing customer base. IQ Bot supports semi-structured and unstructured data-centric processes and several pre-trained use cases, and Automation Anywhere's general-purpose engine can be trained in a few days to support new document types and business processes. It has implemented DevOps improvements on the server-side architecture to exploit a microservices architectural approach. This has resulted in significant acceleration in product development, as well as fostering an API-led approach to integration with third-party applications and services.

Dedicated focus on leading across every facet of enterprise RPA engagements

It is hard to find another relatively small enterprise software vendor so focused on improving and progressing on all key facets of a customer engagement. Automation Anywhere has a sharp focus on market dynamics and evolving customer requirements to enable it to deliver greater value to its customers via dedicated CSMs. Series A funding has also enabled it to focus on geographic expansion and aggressive recruitment across all key enterprise functions. Automation Anywhere's RPA proposition is built on strong technical credentials across key pillars of RPA productization, as indicated by high scores across the development features and UX; automation and execution capabilities; security, monitoring, and governance; and AI capabilities criteria groups. With its dedicated and aggressive execution of product and GTM strategies, we expect Automation Anywhere to continue to grow at above market average growth rates in the next two to three years.

Weaknesses

RPA PaaS product and cloud-specific pricing models could have been introduced earlier

This is more of an area for improvement rather than a weakness, and Automation Anywhere is already working toward meeting these requirements. With Automation Anywhere's track record and growth ambitions, it had a clear opportunity to lead in the market with an RPA PaaS product offered under cloud subscription-based pricing models. Thoughtonomy was a leader in terms of introducing a

SaaS-based RPA product, and Automation Anywhere is expected to introduce a cloud-based RPA product over the next three to four months. Once introduced, we expect this product to emerge as a growth driver for Automation Anywhere. There is, however, a need to better educate customers that might have data security and privacy concerns about cloud deployments. Automation Anywhere should therefore focus on developing marketing campaigns in association with its consulting partners to alleviate security concerns and evangelize on the benefits of cloud economics associated with the consumption of RPA capabilities under a SaaS/PaaS model.

Opportunities

European and Asia-Pacific RPA markets

Automation Anywhere has one of the leading market shares in its home turf of North America and has rapidly expanded its footprint in Europe, Japan, and Asia-Pacific (Southeast Asia, including India in particular). As more and more RPA implementations move closer to shared services and outsourcing centers, Southeast Asia is emerging as a rapidly growing RPA market. Then there is also scope for growth in industrialized Western Europe. Automation Anywhere is already executing a well-paced geographic expansion strategy and it would not be surprising if a majority share of its future growth is accounted for by customers based outside North America.

Development of AI IP for IPA

Automation Anywhere achieved a relatively high score for the evaluation criteria group assessing AI capabilities. It uses several open source AI frameworks as part of its RPA offering and provides pre-built integrations with several third-party AI/ML platforms, such as Google Cloud AI, Microsoft Cognitive Services, IBM Watson, Amazon Comprehend, and Predikly.

Automation Anywhere is working toward realizing its vision of offering "full lifecycle" AI for process automation, including process mining techniques to identify opportunities for automation (what to automate), support for automation in VDI/Citrix environments and processing of semi-structured and unstructured data (how to automate), and “next-best-action” and predictive analytics for better business and operational decision making. These initiatives are in the right direction and Automation Anywhere should focus on developing AI IP to further differentiate itself from its closest competitors, including the option of acquiring specialized AI vendor(s). Use of AI to advance IPA credentials is a key source of competitive differentiation and represents a key growth opportunity, more so as RPA expands beyond automation of structured processes and tasks to support end-to-end process automations of greater complexity.

Threats

Fierce competition with other leading RPA vendors with financial muscle and an equivalent urge to grow at a rapid pace

The RPA market has drawn more than significant attention from VCs and institutional investors and the valuations of leading RPA vendors are increasing rapidly on a quarterly basis. In this growing market, just having financial muscle is not enough to maintain competitive positioning. Automation Anywhere will continue to face stiff competition from other leading vendors in this ODM (especially UiPath and Blue Prism), as they execute an equally aggressive growth strategy and compete fiercely with an aim to grow their market share across all key regions.

For this reason, Automation Anywhere must continue to invest in product development and sales and marketing, and quickly respond to requirements of different user personas, such as business users with fewer skills, and regional market dynamics. The global RPA market is ripe for disruption and any vendor with the right balance of aggressive product and GTM strategies has the potential to run ahead of its competitors. There are no permanent “leaders” and “challengers” in this market.

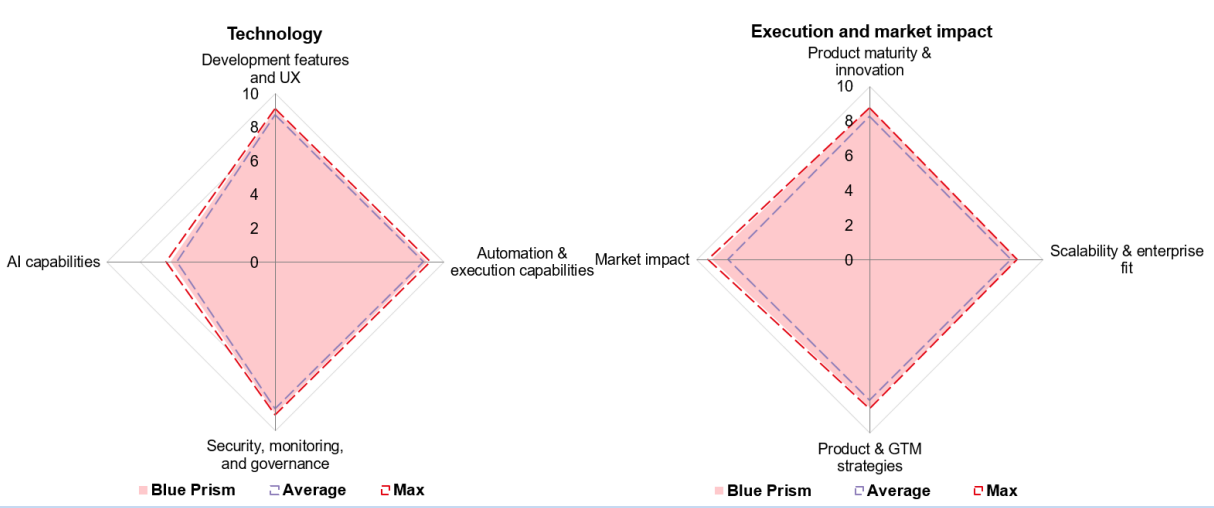
Blue Prism (Ovum recommendation: Leader)

Table 5: RPA products and/or architectural components evaluated, Blue Prism

Blue Prism Enterprise RPA Platform	Application server (central server and security principal v6.3)
	Runtime resource (robot runtime software v6.3)
	Interactive client (client software for administration & development v6.3)
	Login agent (optional Windows authentication plugin v5.0.23)
	MAPIEx (outlook MAPI email client plugin v2.0.6)

Source: Blue Prism

Figure 5: Blue Prism radar diagrams



Source: Ovum

Ovum SWOT assessment

Strengths

Leading vendor with a comprehensive RPA platform and a strong track record of success

Blue Prism achieved high scores across each criteria group under the technology and execution and market impact assessment dimensions. As the first specialized RPA vendor to trade on public markets, Blue Prism had an IPO in March 2016. According to its half-year results for the period ending April 2018, Blue Prism’s revenue grew by 145% on a year-on-year basis and recurring licensing

revenue accounted for a 93% share of this revenue figure. Its current market capitalization is over £1.24bn.

In 2018, Blue Prism rapidly grew its customer base in the Americas and Asia-Pacific regions, while maintaining its strong position in the EMEA region. Blue Prism offers an API-rich platform and recently introduced the Blue Prism Digital Exchange (DX) that provides access to a range of AI/ML, analytics, OCR, and other capabilities. Blue Prism has a strong product roadmap for execution over the next 12 months and has invested in IPA-focused initiatives in areas such as adapting to evolving process patterns and deriving contextual meaning, understanding and contextualizing visual information, workload optimization, and autonomous resolution of business and system problems.

Strong technical credentials in terms of enterprise RPA capabilities

Blue Prism RPA platform has a cohesive, modular architecture with component-level APIs, and offers load balancing, high availability (HA), and DR and failover (active/active and active/passive) capabilities as standard features. It has certified reference architectures for major IaaS providers (Microsoft, Amazon, Google, and IBM), with resilient and elastically scalable topologies.

It achieved a high score for the security, monitoring, and governance criteria group under the technology assessment dimension. Other noteworthy features include centralized work queue management, intelligent scheduling, dynamic capacity management, role-based access control (RBAC), and encryption and credential management.

Weaknesses

Blue Prism would benefit from further improving ease of use for less skilled users and the introduction of an RPA PaaS product

These are more areas for improvement than they are weaknesses. Blue Prism follows a business user-centric approach to RPA UX. The RPA user base in enterprises includes business users (not experienced bot developers or RPA practitioners) that do not have a significant level of technical skills. In the context of less skilled users, customer references indicate that the Blue Prism RPA platform is easy to train on but in some cases (depending on the complexity of a specific process/task automation use case), its actual application may require more technical skills.

With its competitive positioning and growth ambitions, Blue Prism should focus on developing a fully packaged RPA PaaS offering the true benefits of a cloud service. RPA vendors including Thoughtonomy and Kryon have already introduced their RPA PaaS offerings, and Ovum expects the global spend on the RPA PaaS market to grow much faster than that for on-premises RPA software. Many enterprises are interested in using an RPA PaaS to implement and scale faster without having to worry about the underlying infrastructure and complexity associated with frequent upgrades. With the modular and API-rich nature of Blue Prism RPA platform and its experience in SaaS pricing, it would be easy to develop an RPA PaaS using these foundational architectural components.

Opportunities

RPA PaaS and AI IP as a source of competitive differentiation

For Blue Prism, RPA PaaS represents a key growth opportunity, and the development of an RPA PaaS will not require a strategic shift or extensive investment in product development. It already has foundational elements in place in terms of a modular architecture and experience of offering RPA hosted over partners' IaaS clouds and sold under a SaaS pricing model.

Blue Prism has a dedicated focus in terms of developing a sound IA proposition and partnerships with several key AI/ML product vendors. Ovum believes that AI IP will be a key source of competitive differentiation in a market where core RPA product features are likely to be commoditized over the next two to three years. Blue Prism should therefore focus on developing AI IP to drive greater user productivity and maintain its edge in terms of product innovation.

Threats

Blue Prism has a critical position in a rapidly evolving and highly competitive RPA market

Blue Prism has capitalized on its early-mover advantage in the global RPA market, with rapid growth achieved over the last couple of years. Its nearest competitors, Automation Anywhere and UiPath, have similar attributes in terms of final muscle and a strong track record of success in an initial phase of growth, as well as aggressive growth ambitions. Blue Prism will continue to face stiff competition from its nearest competitors as they execute aggressive geographical expansion and sales and marketing strategies. It will need to continue to innovate and execute well against its growth plans to maintain its position and market share in a highly competitive market.

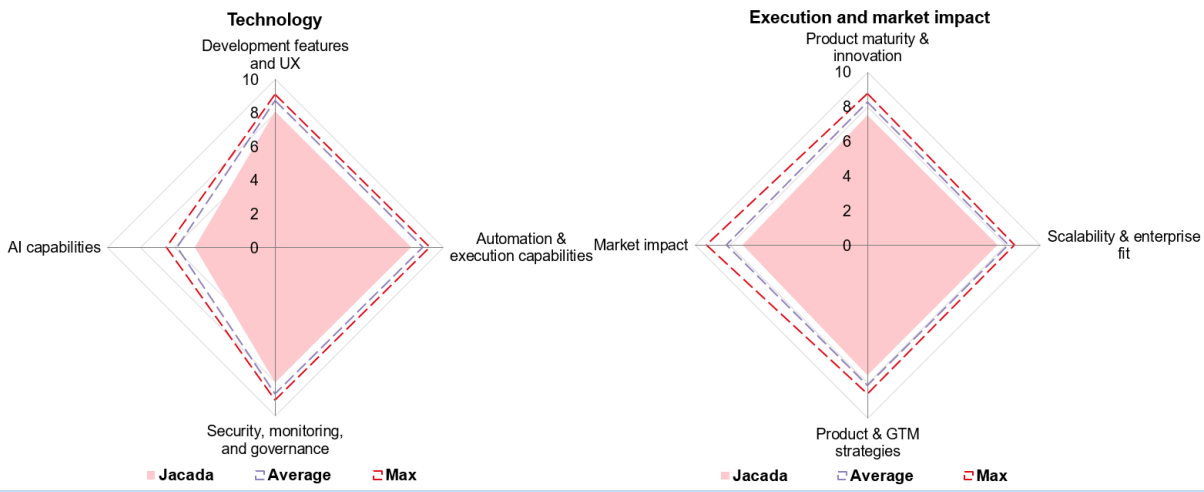
Jacada (Ovum recommendation: Challenger)

Table 6: RPA products and/or architectural components evaluated, Jacada

RPA product	Jacada Customer Service RPA

Source: Jacada

Figure 6: Jacada radar diagrams



Source: Ovum

Ovum SWOT assessment

Strengths

Jacada has extensive experience and is a leading vendor in customer service RPA space

Jacada's 25 years of experience has resulted in the blending of live agent skills with chatbot and self-service capabilities supporting a rich and intelligent dialog with customers, with NLP capabilities to determine customer intent. In cases where a hand-off is required to a human, the chatbot uses the

opportunity to offer cross-sell and upsell to customers, enriching the customer experience. Jacada makes it easy to eliminate agent guidance in cases where decisions follow consistent rules (for example, when the amount claimed for a refund is less than a certain limit and the client has a clean record of payment).

Business rules can then be created and Jacada Interact platform used to amend the process flow to fully automate chatbot interaction with the customer. Jacada's design paradigm supports build-once-and-use-anywhere methodology, where an automation process designed for a specific channel (mobile, web, or phone) can be leveraged by any other channel. Jacada supports both attended and unattended automation modes, with any defined process usable in either of the modes. Jacada's expertise and IP are primarily applied to attended automation use cases that involve front-office processes or, more specifically, customer service operations. It is just a choice on part of Jacada to target this market opportunity, and with time, we expect the application of Jacada's RPA offering to a broader set of use cases. Jacada must be considered and closely evaluated by enterprises looking for attended automation for customer service operations.

Simplified integration with services and back-end systems and support for sophisticated business rules

Jacada supports simplified integration to enrich customer interaction by linking with back-end systems or using external services. Its integration center offers a wizard-driven designer that users can, for example, use to initiate a RESTful service call. The business rule designer supports "if, then, and else" type statements that can be encapsulated to add more conditions and groups to support relatively complex decision and process flows. Jacada's product strategy revolves around customer service use cases and it has a sharp focus on maintain its leading position in this specific RPA market segment. In terms of product roadmap, it is working on providing a new automation designer aimed at business users, and "click and record" capabilities for automatically generating an automation sequence.

Weaknesses

Jacada's focus on attended automation for customer service operations leaves out opportunities targeted by most RPA vendors

Jacada is a leading vendor in the space of customer service RPA and maintains a key focus on attended automation. While this has helped it to grow and expand its footprint, Jacada does not really compete with most of the RPA vendors that target opportunities involving mainly automation of back-office processes and to a lesser extent, front-office processes. The split of attended versus unattended automation for most RPA vendors is still tilted toward unattended automation. In most enterprises and for most RPA vendors, a greater percentage of software robots is deployed for the automation of back-office processes. Owing to these factors, Jacada has restricted its growth potential to a specific RPA market segment.

Nascent state of AI/ML strategy

Jacada does not intend to develop its own NLP services and relies on Google, IBM, and other vendors for AI capabilities. While this strategy might work for its current requirements, in the longer term, we see this as a barrier to growth. As identified in this ODM, the core RPA capabilities are likely to be commoditized over the next two to three years, and AI IP for intelligent process automation will be a key source for competitive differentiation in the context of the application(s) of a specific RPA

product. Jacada has indicated that it is working on AI/ML models that will improve the productivity of call center agents and customer experience.

Opportunities

Customer service RPA has a great growth potential

Jacada states that there are currently between eight and 10 million agents around the globe, with close to 100 billion user sessions. The ability to significantly reduce the cost of customer service while improving the user experience (UX) is therefore a huge market opportunity, which Jacada is well placed to exploit to drive near-term revenue growth.

Jacada's RPA platform integrates with IBM's Watson, Google's Dialogflow, and Facebook AI, and Jacada has intentions to use AI to learn and automate based on the experiences of the best customer service agents. In the near term, users can expect to see software robots that self-discover, self-build, and self-correct according to changes in UI/applications. This augurs well for maintaining Jacada's competitive edge in this RPA market segment.

Threats

Larger RPA vendors offering a broader set of capabilities

The current focus of Jacada is to support automation of customer service operations. Larger, comprehensive RPA vendors with an aggressive product strategy and substantial external funding can develop extensive capabilities to compete with Jacada for customer service RPA opportunities.

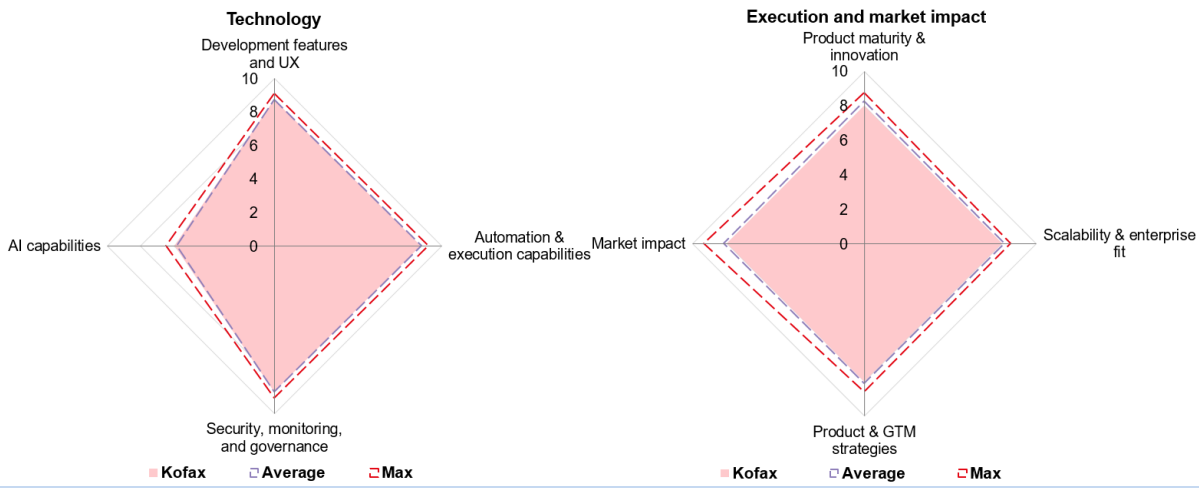
Kofax (Ovum recommendation: Challenger)

Table 7: RPA products and/or architectural components evaluated, Kofax

Kofax Kapow (renamed as Kofax RPA)	v10.3
Kofax TotalAgility	v7.5
Kofax Process Intelligence	v6.0

Source: Kofax

Figure 7: Kofax radar diagrams



Source: Ovum

Ovum SWOT assessment

Strengths

A balanced RPA offering, good end-to-end automation proposition, and strong footprint in the large enterprise segment

Kofax streamlines the process of building, deploying, and managing automation solutions that bring together a range of capabilities, such as RPA, cognitive capture (multichannel support), and BPM analytics. Embedded process intelligence capabilities bring insight and control to simplify the monitoring and governance of what exactly automation is doing, including how workflows are executed and performance against SLAs and KPIs.

Kofax achieved balanced scores across the four criteria groups under the technology assessment dimension. Kofax's RPA product (Kofax Kapow now renamed Kofax RPA) has a sound architectural foundation and Kofax software robots can be exposed to other workflow systems and processes via synthetic APIs. The Kofax RPA product contains an embedded web browser and supports native web rendering. Kofax software robots are not installed on desktop machines, but instead are stored and managed centrally. There is therefore typically less need for a substantial virtual desktop infrastructure (VDI) footprint. Kofax RPA also supports screen automation for recognizing objects based on computer vision ML capabilities. Kofax Robotic Process Intelligence, a web-based solution that delivers interactive views regarding system performance and robot operational metrics, makes it easy to visualize performance metrics out of the box without having to develop any custom code. Kofax is a leading vendor in the document capture market, pairing OCR with machine learning to enhance the degree to which information can be extracted from documents.

If only the technical proposition is considered, Kofax would qualify as a leader in this ODM. Kofax's strategy, however, is to use RPA as a gateway to a much larger intelligent automation market and upsell/cross-sell to its customer base of over 20,000, a significant proportion of which is accounted for by large enterprises. Kofax Intelligent Automation is Kofax's GTM strategy around bringing together its complementary "smart automation" products to widen the scope of processes that can be automated. Kofax has several large-scale RPA implementations in the banking industry and recently secured competitive wins against leading RPA vendors, including those offering BPM and RPA in combination.

Large enterprises should consider Kofax RPA along with the leading RPA vendors, especially for document-centric, end-to-end process automation use cases.

Weaknesses

Improvements in execution are required to operationalize strategy and gain market share

Kofax has several products that can be deployed together to automate end-to-end processes. With its footprint across customers using Kofax OCR and BPM products, and the fact that Kapow Technologies was acquired in 2013, Kofax has taken longer than anticipated to tightly integrate its products, develop a dedicated strategy, and execute toward exploiting the rapidly growing intelligent automation market opportunity. Over the last few years, its revenue and customer base have grown at lower rates than those of leading RPA vendors, many of which did not have an established track record in the large enterprise segment.

The current RPA market dynamics call for aggressive execution to operationalize growth strategy, both in terms of aggressive sales and marketing and fast response to evolving user requirements. In terms of product capabilities, Kofax will benefit from improvements in its process discovery capabilities and the use of AI to accommodate ingestion of unstructured data along with the integration of predictive analytics and ML in workflows. Recent releases of Kofax RPA (October and November 2018, not considered for this ODM) have, however, now addressed some of these areas. Kofax has introduced a 12-month free trial and integrated cognitive document automation capabilities to support the capture of data from structured and unstructured document sources.

The next Kofax RPA release will include process discovery and robot revision control and deployment management capabilities. Kofax plans to offer robot services in the cloud and in this context should consider (given its architectural attributes) offering a fully packaged RPA PaaS (not a cloud hosted offering) under a SaaS pricing model. With better and faster execution against its product and growth strategies, Kofax can move up as a leader in the next iteration of this ODM.

Opportunities

Cross-sell/upsell to existing customers aiming to achieve end-to-end process automation

Kofax has an opportunity to cross-sell/upsell RPA to existing customers using its OCR and BPM products. Not many vendors offer BPM/case management, RPA, OCR, and process intelligence in a well-integrated product set, and Kofax has a strong footprint in the large enterprise segment, a significant share of which is looking to adopt RPA to realize end-to-end process automation. With Kofax investing in dedicated marketing for RPA and targeting IPA opportunities, its enterprise mindshare is expected to improve. Kofax needs to undertake effective market messaging and educate existing and potential customers on the overall proposition of its product set aimed at IPA use cases.

Threats

Leading RPA vendors targeting IA and end-to-end automation opportunities

Kofax will face significant competition from leading RPA vendors such as Automation Anywhere, Blue Prism, and UiPath that are developing their IA proposition with a dedicated focus on improving AI capabilities. With its market positioning, Kofax will also face competition from BPM vendors offering RPA products, such as Pegasystems and IBM, and vendors in strategic partnerships.

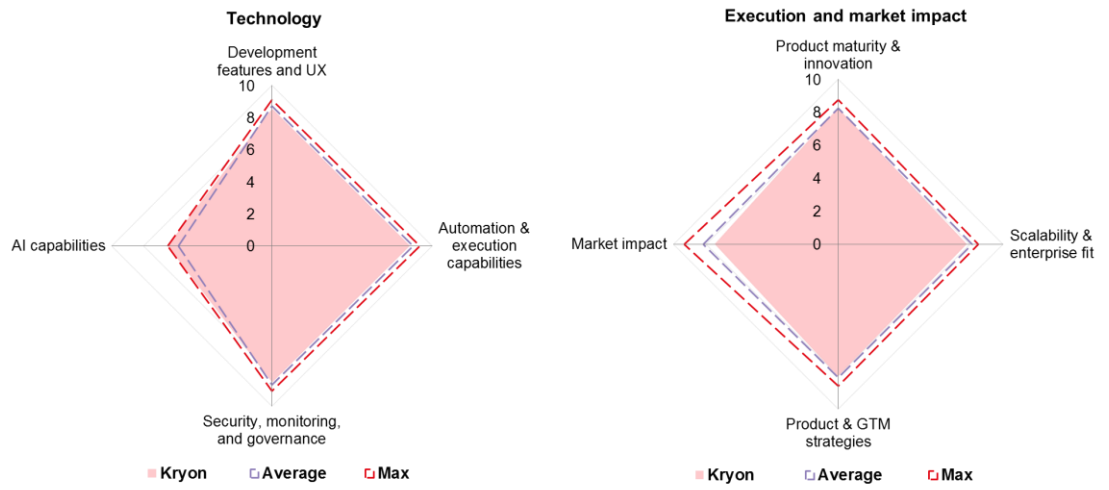
Kryon (Ovum recommendation: Challenger)

Table 8: RPA products and/or architectural components evaluated, Kryon

Kryon RPA (v5.25)	Kryon Studio
	Kryon Console
	Kryon RPA Server
	Kryon Process Discovery Server
	Kryon Robots
	Kryon Admin

Source: Kryon

Figure 8: Kryon radar diagrams



Source: Ovum

Ovum SWOT assessment

Strengths

Leading AI capabilities extending an evolving RPA platform

Kryon achieved the highest score for the AI capabilities criteria group under the technology assessment dimension. It has patented AI visual and deep learning technologies and is working on enhancing AI capabilities in areas such as proprietary predictive analytics for RPA, a design time algorithm for object identification and data collection, auto-healing RPA processes, and continuous process optimization. Kryon has partnered with Software AG to offer webMethods BPMS for managing processes, tasks, cases, and rules. It also has partnerships with Verint and OpenConnect.

Its RPA platform supports unattended, attended, and hybrid automation, with “hybrid automation” referring to an automation paradigm where human and virtual workforces work collaboratively and pass tasks to each other with full visibility. Another key feature is a web-based management console

for real-time monitoring of the virtual workforce. Kryon offers a comprehensive approach to process discovery identifying processes, providing automation recommendations and enabling the subsequent development of automation workflows. If it were only about the score for the technical assessment dimension, Kryon would qualify as a leader in this ODM. The RPA platform has evolved at a good rate and for the next few releases Kryon has plans to introduce a bot store, as well as to provide support for mobile web applications automation, strengthen security capabilities, and support implementation of on-demand, self-invoking robots.

Weaknesses

Execution is lagging in terms of driving rapid adoption and competitive market dynamics

Global spend on RPA software is growing rapidly and several vendors have been successful in adding hundreds of customers every quarter over the last 12 to 18 months. Leading RPA vendors have executed well against aggressive sales and marketing and geographic expansion strategies to increase their market share. While Kryon has introduced significant innovation via its RPA platform, its revenue and customer base have grown at rates lower than those of several RPA vendors. Kryon secured $12m in series B funding in 2017, and with the recent funding trends in RPA market, it would be a good option for Kryon to secure additional funding to fuel the next phase of its growth. This would provide it with the much-needed financial muscle to innovate faster and expand its reach to new markets and customer segments with the ultimate objective of increasing market share. The expansion of its partner network to add more BPM vendors and professional services/consulting/system integrator (SI) partners with strengths in specific regions is another option to drive revenue growth. The current RPA market dynamics call for aggressive execution and with its focus on supporting end-to-end process automation and significant differentiation in terms of AI capabilities, Kryon has the potential to achieve rapid growth in the near future. Some of the technical features currently missing in its RPA platform are included on the product roadmap, and with better execution, we expect Kryon to move up to become a leader in the next iteration of this ODM.

Opportunities

Exploiting IPA opportunity with dedicated AI IP

Not many RPA vendors have developed dedicated AI IP to target IPA opportunity and this is an area where Kryon has a clear differentiation. Considering its current roadmap for AI capabilities, Kryon will continue to build upon the existing differentiation. An impending bot store, evolving process discovery capabilities, and other key features part of AI capabilities roadmap form a good combination for driving near-term growth. IPA represents the next phase of evolution of RPA beyond automation of structured processes and tasks and with better execution, Kryon can exploit this growing market opportunity.

Threats

Stiff competition in a rapidly-growing RPA market

Global and regional RPA markets are growing rapidly and there is stiff competition between RPA vendors focused on growing their market shares. With its competitive positioning, Kryon will face significant competition from the leading RPA vendors executing aggressive growth strategies and other RPA vendors focusing on driving adoption in the next phase of evolution of their value proposition. The current nature of competition in RPA market calls for faster moves aimed at

expanding reach to new markets and customer segments. Kryon must act to capitalize on its product-centric differentiation and increase its market share.

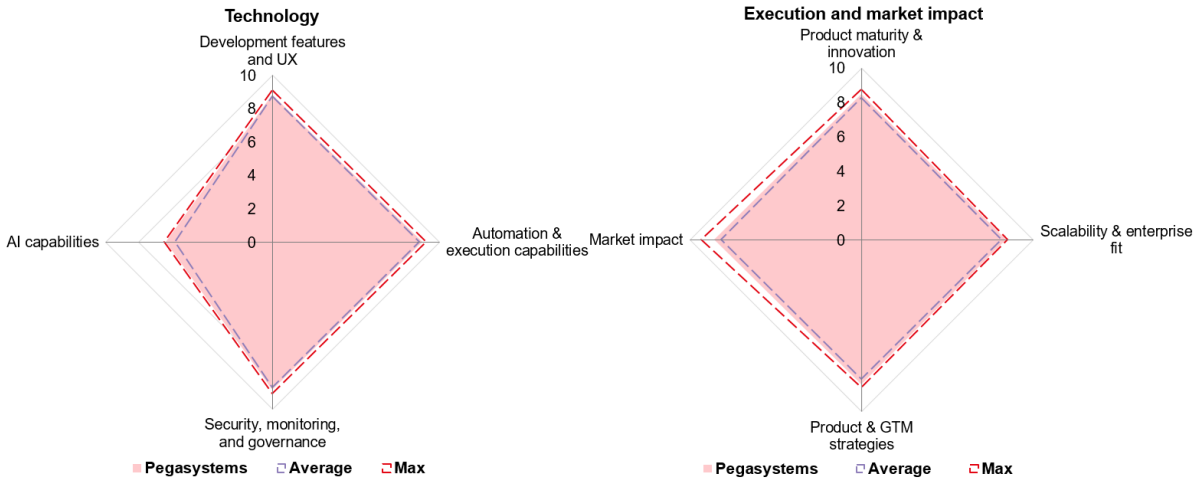
Pegasystems (Ovum recommendation: Leader)

Table 9: RPA products and/or architectural components evaluated, Pegasystems

Pega Robotic Automation Studio and Runtime	v8.0 SP1
Robot Manager	v5.0

Source: Pegasystems

Figure 9: Pegasystems radar diagrams



Source: Ovum

Ovum SWOT assessment

Strengths

Strong credentials across key pillars of enterprise RPA

Pegasystems achieved a high score in each of the four criteria groups under the technology assessment dimension. Pega Robotic Studio is a no-code development environment for building attended and unattended RPA automations. About 20% of its deployed software bots are unattended, while 80% are for attended automation.

The Pega Platform enables end-to-end process automation. At the core of the Pega Platform is Pega Case Management, which enables the seamless transition of work from humans to bots, as process steps change from ad-hoc to routine in nature. Connectors to a range of enterprise applications including SAP, Salesforce, JD Edwards, Zoho, and Microsoft Sharepoint are available through the Pega Exchange. Customer engagements tend to be more strategic and deeper, and on average involve a greater number of software bots. Pegasystems has supported RPA implementations involving more than 35,000 software bots and several others involving over 10,000 software bots.

As part of the Pega Platform, Pega Robotic Automation can take advantage of native AI capabilities supporting real-time decisioning and offering algorithms for “next best action” and recommendations, as well as making sense of large volumes of data. Pega Workforce Intelligence (WFI) offers

continuous desktop analytics for operational intelligence, including monitoring, optimizing, and prioritizing new bot development. In short, it is a good offering covering all key pillars of enterprise RPA.

Attractive value proposition for large enterprises pursuing end-to-end process automation

Pega Robotic Automation offers a framework for end-to-end process automation by combining RPA (attended and unattended), BPM, dynamic case management, AI, and desktop process analytics. Pega's RPA product can be extended to the broader Pega platform, and customers implementing it with the packaged Pega platform can exploit case management, no-code, UI, and API integration capabilities. Large enterprises struggling to scale with piecemeal approaches should consider Pegasystems for end-to-end process automation initiatives.

Weaknesses

The overall value proposition is less attractive for the mid-market and small-scale initiatives targeting quick wins

Pegasystems does not target mid-market organizations and its overall value proposition and pricing is less attractive for these enterprises. A long tail of opportunities in the global RPA market are represented by small-scale initiatives where RPA is used as a tactical or modular solution for achieving quick wins, even though these initiatives can be later expanded into broader implementations. With its positioning as a full-stack vendor enabling end-to-end process automation, Pegasystems is less appealing to enterprises that do not have a clear, upfront strategy or investment potential for broader process automation implementations. It is a choice rather than a weakness on the part of Pegasystems to target large enterprises and broader implementations that can exploit BPM, dynamic case management, AI, and process analytics to achieve end-to-end process automation. In terms of technical capabilities, Pegasystems does not offer AI capabilities to improve OCR and image processing (for example, computer vision and intelligent OCR), but there is support for object-level injection to identify changes in applications.

Opportunities

Replacing incumbent vendors in enterprises struggling to scale their RPA implementations

There are several cases where enterprises have struggled to scale their RPA implementations due to technical limitations and a lack of clear strategy in terms of how RPA fits into the larger vision of end-to-end process automation. In many cases, enterprises had to replace an incumbent RPA vendor/solution owing to similar issues. Pegasystems represents a good option for enterprises pursuing end-to-end process automation with a unified platform for intelligent BPM and RPA.

Unique positioning for end-to-end process automation

There will be growing realization among large enterprises that ad hoc RPA initiatives fail to deliver significant value and that piecemeal approaches to process automation are not scalable and sustainable in the long term. Throwing software bots at a problem without much thought, governance, or a clear strategy is unlikely to deliver any significant business value. Pegasystems is uniquely positioned in the market for supporting end-to-end process automation initiatives in large enterprises that are pursuing scalable RPA implementation as part of a broader enterprise process management/automation strategy.

Threats

Competition with leading RPA vendors and BPM vendors offering RPA solutions

Pegasystems will continue to face significant competition from the other leading RPA vendors in this ODM. It will also face competition from BPM vendors offering RPA solutions, including as part of strategic partnerships. IBM's partnership with Automation Anywhere, UiPath's partnership with Oracle, and Appian's partnership with Blue Prism are good examples of this.

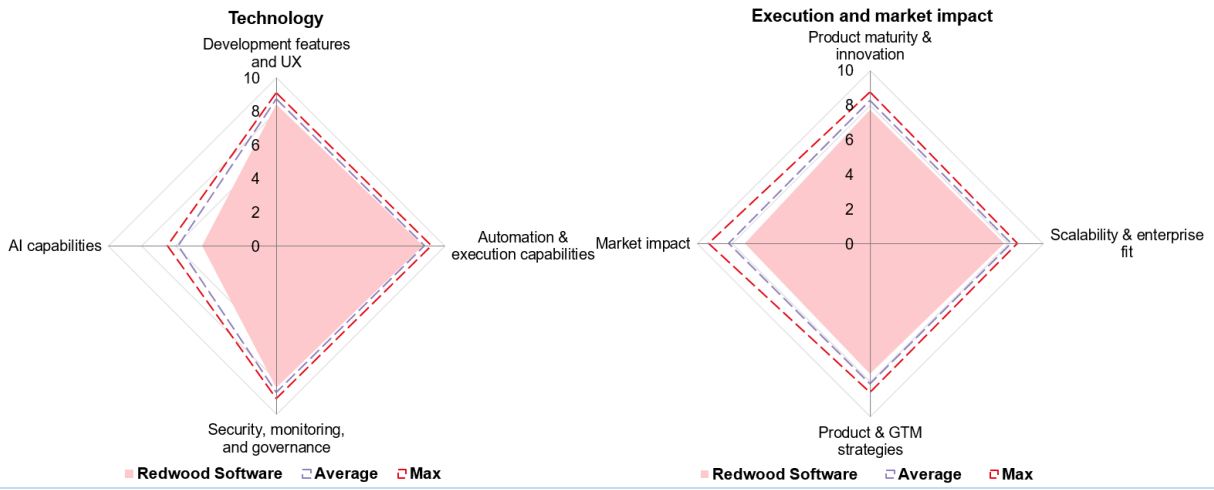
Redwood Software (Ovum recommendation: Challenger)

Table 10: RPA products and/or architectural components evaluated, Redwood Software

RPA product	Redwood Robotics (v4.1.2)

Source: Ovum

Figure 10: Redwood Software radar diagrams



Source: Ovum

Ovum SWOT assessment

Strengths

An extensive library of pre-built robots and experience in automating processes involving SAP applications

One of Redwood's main strengths is its wealth of process knowledge and 25 years' experience in the process automation market. It has experience in the enterprise resource planning (ERP) segment and its pre-built catalog of robots are well received and acknowledged in the marketplace.

The robots are developed, supported, and maintained by Redwood process experts so that any customer can immediately use the automation (it drives user productivity), rather than worrying about developing and maintaining robots. Customers are still free to develop their own robots if needed, but the catalog significantly reduces the cost, effort, and time involved in robotic automations.

Redwood offers a simple pricing model reducing cost of automation

Redwood Robotics also has a unique license model where there is no limitation with respect to computing capacity, and customers only pay for the automation they use in a production environment, be it on-premises or in the cloud. Redwood will only charge customers a robotic service charge when a unit of work has been executed within the business that is the equivalent of something someone would do manually. The pricing model results in a significant reduction in manual costs.

Weaknesses

Redwood is lagging in terms of IPA proposition

Ovum has identified IPA as the next frontier for RPA vendors. From this perspective, in-house development of AI capabilities and/or via partnerships with key AI vendors is of paramount importance. With analytics- and AI-enabled capabilities, such as process discovery and "next best action" becoming not uncommon features of RPA products, it is time for Redwood to develop a clear strategy for this emerging market opportunity.

Redwood is not claiming that its RPA solutions are AI-driven. It is actively working on what it calls an intelligent robot catalog, and this will also contain some machine learning. The intelligent robot catalog works in combination with the design studio and will give users recommendations about meaningful processes combining individual robots to form an end-to-end process.

Redwood's market share and revenue has not grown in line with the RPA market average

Despite having a lot of experience and a significant footprint across the globe, Redwood's market share and revenue has not grown at the same rates as the RPA market overall in the last couple of years. While Redwood enjoys a significant enterprise mindshare for process automations involving ERP applications, it has a lesser mindshare for other use cases. To improve on these parameters, Redwood should focus on a dedicated product strategy aimed at IPA and a broader set of use cases beyond ERP-led automation opportunities. There is a clear need for more aggressive marketing to improve its visibility at a global level.

Opportunities

Targeting educated RPA buyers and further penetration with SAP partnership

The biggest opportunity for Redwood is its growing customer base that is better educated and informed about what traditional RPA can and cannot deliver. Customers that Redwood refers to as "modified re-buyers" are coming back with a much clearer understanding of what they want to do next.

Another opportunity comes from Redwood's relationship with SAP and the extensive robotic automation it supports for related use cases. There is significant market opportunity in terms of RPA implementations involving SAP ERP applications. However, Redwood should be more aggressive in making the most of this opportunity before other RPA vendors develop a similar competitive proposition. Redwood is seeing more customers increase their robotic footprint not only across existing functions, but also across wider back-office functions, such as finance, HR, supply chain, and IT. It is also looking into process discovery tools partnerships.

Threats

Larger RPA vendors offering a broader set of capabilities

Redwood will continue to face stiff competition from larger RPA vendors, especially for task and process automation opportunities where SAP and ERP applications are participants. To improve its intelligent process automation proposition, Redwood needs to do more to clarify the market perception that other RPA vendors offer more AI capabilities, particularly dedicated product development and/or partnerships. Redwood is investing in machine learning technologies that help in process design, with an aim to make it as simple as possible to define a robotic process where the system itself can guide the user to make the best possible choices. Because increasing the number of implementation and technology partners would be helpful, Redwood is looking for partnerships with technology providers specialized in areas such as chatbots and recommendation systems.

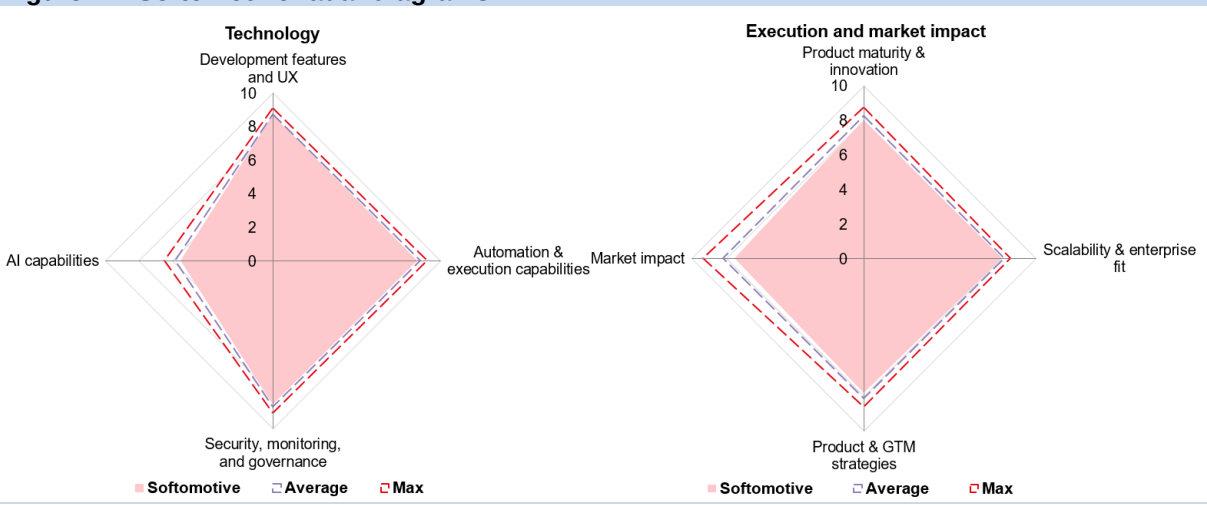
Softomotive (Ovum recommendation: Challenger)

Table 11: RPA products and/or architectural components evaluated, Softomotive

	Process Studio
	Insights Dashboards
	Robots (SideBots - SoloBots)
WinAutomation (v8)	WinAutomation Console and WinAutomation Process Designer

Source: Softomotive

Figure 11: Softomotive radar diagrams



Source: Ovum

Ovum SWOT assessment

Strengths

A balanced and evolving RPA proposition is a good option for starting small and achieving rapid ROI

Softomotive offers both serverless (WinAutomation) and server-based RPA (ProcessRobot) solutions that share the same engine, enabling users to transition without disruption. A common adoption

pattern is to start with WinAutomation to achieve quick ROI and then scale to ProcessRobot. There is support for both attended and unattended automations. Softomotive offers attractive pricing models, including per software robot, per user, and annual SaaS-based pricing. It provides more than 300 pre-built actions/activities that can be used as building blocks for developing processes or custom user libraries. Softomotive offers seamless integration with ABBYY (FineReader and FlexiCapture), Google Tesseract, and Microsoft Modi OCR products. AI services from Microsoft, Google, and IBM Watson are included for enabling smart automation.

Users can run multiple bot process automations and robot software (agents) concurrently on the same machine, which maximizes hardware utilization, and multiple processes can be executed in parallel. Softomotive supports on-premises and public, private, or hybrid cloud deployments, with high-availability and DR options enabling horizontal scalability. Web-macro recorders help with the recording of web-desktop user activity and enable faster generation of automations. Key areas for product development include a unified modular architecture, an open SDK and enhancements in open API for the platform, support for multiple SoloBots on single virtual machine, a built-in user store, and the Softomotive RPA marketplace. Softomotive SoloBots are software robots executing unattended automation. SideBots are dedicated robots for process automation in attended mode (alongside users), which may or may not need human involvement. Softomotive is a strong performer and would qualify as a leader in this ODM if technology assessment only is considered.

Weaknesses

Execution needs to catch up with competitors and improvement in market awareness should be a priority

Even though Softomotive was founded in 2005, its revenue growth and enterprise mindshare (and market awareness) lags in comparison to leading RPA vendors and some of its nearest competitors. It has a broad partner network, but this has not translated into rapid revenue growth when compared to the growth achieved by other RPA vendors in this ODM. Taking into consideration the product roadmap that Softomotive plans to execute over the next 12 to 18 months, it is important to invest in aggressive sales and marketing to realize the true growth potential of its RPA solutions. A recent series A financing round of $25m (in September 2018) represents a good development in this regard. While integration with several third-party and open source AI frameworks/platforms is an easy option, Softomotive should focus on developing dedicated AI IP to drive user productivity and end-to-end automation. Core RPA features are likely to be commoditized over the next two to three years and dedicated AI IP for supporting IPA will be a key source of competitive differentiation. In this context, use of AI to support process discovery and continuous process optimization are key requirements. Other key areas for improvement include support for real-time decisioning for next-best-action recommendations and security capabilities, such as support for SAML 2.0, Veracode, and Oauth standards.

Opportunities

Robot-as-a-service (RaaS) and attractive value proposition for medium-sized enterprises

Softomotive is pursuing RaaS as an end-to-end solution providing users with the benefits of RPA without having to handle deployment, maintenance, and operational control. This is along the lines of a managed service and we expect many enterprises to opt for this model for RPA delivery.

Not many RPA vendors offer pricing and deployment models that align well with the requirements of midsize enterprises. With its flexible pricing models and enablement of organizations looking to start small and achieve quick ROI, Softomotive has a good RPA proposition for midsize enterprises.

Threats

Competition with leading RPA vendors and nearest challengers

Softomotive will face stiff competition from the leading RPA vendors in North America, Europe, and Asia, which are its key markets. Most of these vendors have made substantial investment in expanding their direct footprint or reach via partner network, as well as dedicated marketing initiatives for increasing enterprise mindshare. Softomotive will face competition from other RPA vendors with technically competitive offerings and investments to improve execution capabilities to drive growth in adoption and expansion into new markets and customer segments.

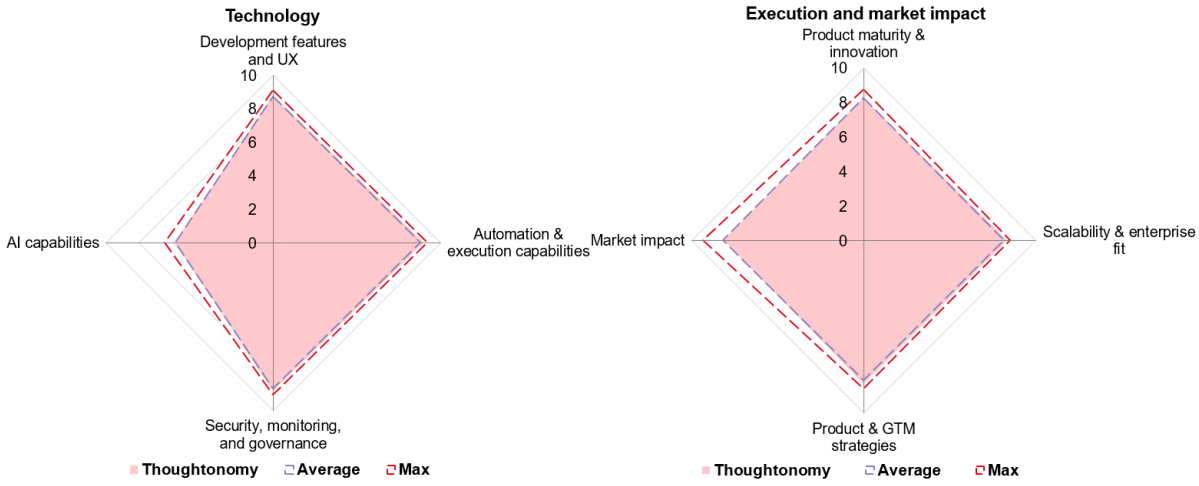
Thoughtonomy (Ovum recommendation: “Leader”)

Table 12: RPA products and/or architectural components evaluated, Thoughtonomy

Thoughtonomy Virtual Workforce	Evolution edition

Source: Thoughtonomy

Figure 12: Thoughtonomy radar diagrams



Source: Ovum

Ovum SWOT assessment

Strengths

Thoughtonomy has a well-balanced offering with significant strengths across key RPA productization pillars

Thoughtonomy achieved above-average scores and top-three or -four scores for various criteria groups under the technology assessment dimension. Being the first vendor to offer a true RPA cloud product (branded as a SaaS offering), with autonomous self-management and autoscaling capabilities and substantial AI enhancements, Thoughtonomy has developed a sound architectural and product foundation. Thoughtonomy’s RPA product offers a workflow (drag and drop)-orientated, no-code

approach and incorporates core Blue Prism RPA software. Thoughtonomy supports both unattended and attended automations.

In terms of AI capabilities, there is support for OCR through computer vision and governed learning to support variations in received documents or images. Thoughtonomy offers pay-per-software bot, per-process, and per-unit work (completed), and annual SaaS-based pricing models. AI/ML capabilities are not charged separately.

Good track record in the initial phase of growth

Thoughtonomy is a good option for midsize enterprises interested in a low-cost entry to RPA. With the provision of SaaS-based software delivery, these enterprises can pursue a "start small and grow big" approach. With more than 200 clients, a substantial partner network, and a solid technical foundation for its RPA product, Thoughtonomy has achieved a good level of initial success in driving revenue growth and expanding global reach. Based on its track record over the last couple of years, Thoughtonomy has demonstrated the potential to grow uickly and attract significant external funding to compete and ultimately win against much larger RPA vendors. On a comparative basis, Thoughtonomy has a strong product roadmap for execution over the next 12 to 18 months.

Weaknesses

Stiff competition in RPA market and the next phase of growth calls for aggressive execution

The current state of Thoughtonomy is not much different from a relatively small enterprise software vendor that has developed a good product with significant differentiation but needs aggressive execution in terms of sales and marketing, and geographic expansion to realize its true potential. With stiff competition and the competitive growth strategies at play in the global RPA market, Thoughtonomy needs to execute more aggressive sales and marketing initiatives. Thoughtonomy's SaaS-based RPA offering is well suited to RPA initiatives in large enterprises and it has a good foundation in terms of AI capabilities. Clearly, it would benefit from an increase in enterprise mindshare. These requirements call for substantial and quick investment, and Thoughtonomy should therefore focus on securing external funding to provide much-needed thrust to its growth initiatives.

Opportunities

Cloud-based RPA products align with the strategic requirements of large-scale implementations

With cloud-based RPA products offering enterprises an option to implement and expand faster without worrying about infrastructure capacity and the complexity associated with regular upgrades, the RPA platform-as-a-service (PaaS) market is poised for rapid growth. Thoughtonomy has an early-mover advantage in terms of offering a SaaS-based RPA product (equivalent to an RPA PaaS in Ovum terminology) and the right attributes in terms of flexible pricing and core AI capabilities to exploit this rapidly growing market opportunity. Moreover, this represents a good opportunity for Thoughtonomy to grow its footprint in the large enterprise segment.

Threats

Thoughtonomy competes with larger, aggressive RPA vendors

Given its market position, Thoughtonomy competes with larger RPA vendors such as Automation Anywhere, Blue Prism, and UiPath that have greater access to capital and growth momentum. Thoughtonomy will continue to face stiff competition from leading RPA vendors for both small and

more strategic deals. It will also face competition from other RPA vendors, such as Kryon and Softomotive, which are close in terms of their size and overall value proposition.

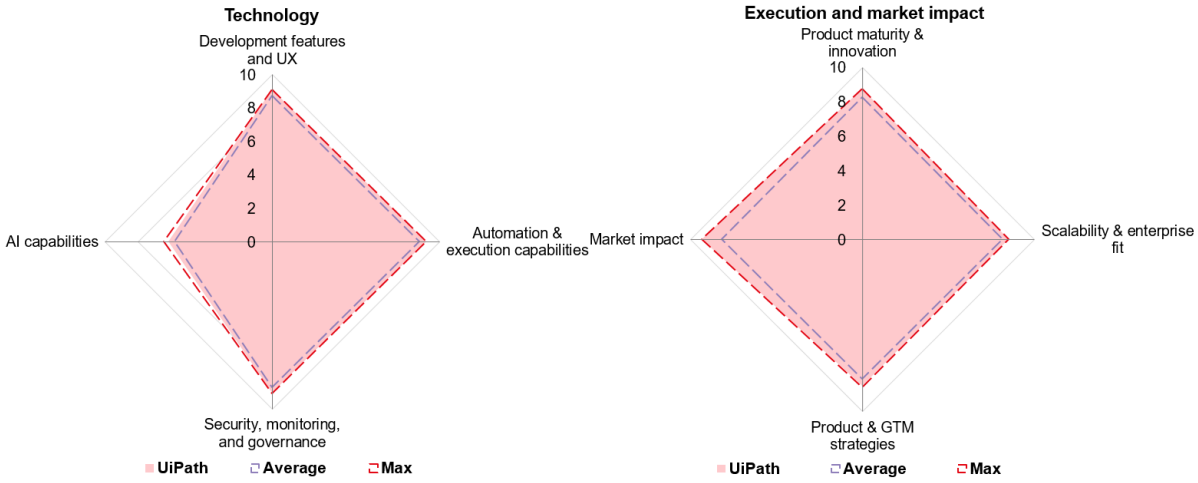
UiPath (Ovum recommendation: Leader)

Table 13: RPA products and/or architectural components evaluated, UiPath

UiPath RPA Platform (v2018.2)	UiPath Studio
	UiPath Unattended Robot
	UiPath Attended Robot
	UiPath Orchestrator

Source: UiPath

Figure 13: UiPath radar diagrams



Source: Ovum

Ovum SWOT assessment

Strengths

UiPath is forging ahead with a leading RPA platform that offers comprehensive features and capabilities

For the technology assessment dimension, UiPath achieved consistently high scores (including highest and second highest scores for specific criteria groups) that indicates a well-balanced RPA platform catering to a range of use cases. For the execution and market impact assessment dimension, UiPath achieved a high score for each criteria group (including highest and second highest scores), a clear indication of the success of its product and GTM strategies in a highly competitive market. Customer references indicate ease of use for all types of user and in particular for less-skilled business users. Computer vision (including Citrix automation), simplified automation development based on Microsoft Workflow foundation, orchestrator multitenancy, and support for high-density robotics (the ability to run several robots simultaneously on a single VM) are noteworthy features. This is also indicated by its highest score for the automation and execution capabilities criteria group.

UiPath has been quick to respond to customer requirements and fill the gaps in its RPA product portfolio. Based on comparative analysis across all vendors participating in this ODM, UiPath has a strong product roadmap for execution over the next 9 to 12 months.

Strong track record of success and execution against an aggressive growth strategy

Having closed its series C funding round that raised $225m at a valuation of $3bn, UiPath now has the financial muscle to execute an aggressive product roadmap and GTM strategy to ultimately increase its market share. Its extraordinary growth in the last year is a clear indication of a good balance between a product roadmap aimed at meeting diverse customer needs and successful execution against aggressive sales and marketing strategies. UiPath has established partnerships with several independent software vendors (ISVs), such as Oracle for low-code process design and automation, and recently with Bizagi and system integrators (SIs) that have played a key role in its rapid growth across key regional markets, as well as providing support for major implementations. In terms of product development, user productivity, enhanced data security, AI/ML-led improvements to support IPA, native integration with third-party applications/solutions, drag-and-drop BPM partner integrations, and simplified docker deployment are the key focus areas. A significant share of UiPath's customer base is using AI-enabled software robots that handle unstructured data to drive robot actions. It has partnered with Celonis to aid process discovery.

In July 2018, UiPath announced that it has crossed $100m mark in recurring annual revenue, growing at a rate of 238% in the first half of 2018 and having more than 1,500 customers. It has an extensive geographical reach via 21 offices spread across the globe. Clearly, UiPath has gained the critical momentum necessary for maintaining and gaining market share in one of the fastest growing software market segments.

Weaknesses

UiPath would benefit from improvements in out-of-the-box integration with key enterprise applications and DevOps support

This is more of an area for improvement rather than a weakness. Customer references indicate a need for plug-and-play integration capabilities with key enterprise applications, such as SAP, Salesforce.com, and Hyperion. UiPath RPA platform has bi-directional integration with Oracle Integration Cloud Service, which in turn provides access to more than 100 adapters to key enterprise applications. However, it would be more useful if customers could have access to similar pre-built adapters/connectors directly from the UiPath RPA platform. In terms of DevOps support, CI/CD, simplified software updates, and software container deployment are areas where UiPath would benefit from improvements. UiPath's product roadmap indicates that most of these areas will be addressed via product releases planned for the next six to nine months.

Opportunities

Its substantial presence in key regions will enable UiPath to exploit the rapidly growing RPA market opportunity

UiPath's customer base and revenue figures are evenly split across North America, Western Europe, and Asia-Pacific and it has an extensive partner network expanding its reach across the globe. This augurs well for UiPath's growth ambitions, because it has already established substantial footprint in the key regional markets that represent the maximum growth opportunity. This is one of the factors for

why UiPath has grown at a rapid rate (well above the market average and the growth rates of other leading RPA vendors) over the last year.

The right foundation for offering an RPA PaaS product

UiPath supports multitenancy and its RPA platform can be hosted on a range of IaaS provisions. It already offers SaaS pricing models. Ovum anticipates that the development of packaged RPA PaaS will present a key growth opportunity for UiPath. With RPA implementations increasing in scope and complexity, many enterprises have shown an inclination to use RPA software under a PaaS model, where the PaaS cloud service provider is responsible for maintaining infrastructure and regular upgrades are easy to push. UiPath has the foundational elements in place to support this.

Threats

UiPath competes directly with leading RPA vendors with aggressive growth strategies

UiPath's nearest competitors, Automation Anywhere and Blue Prism, have the financial muscle and aggressive growth strategies (both in terms of product and GTM strategies) that they have used to grow rapidly and have expand their geographic reach. With the nature of competition among this trio, UiPath will continue to face stiff competition for all types of deal. There are also other vendors, such as Pegasystems and Thoughtonomy, that will compete with UiPath either in terms of strategic opportunities (for example, broader process automation implementations involving BPM/case management) or in terms of creating a substantial presence in a regional market.

Methodology

An invitation followed by the ODM evaluation criteria spreadsheet comprising questions across two evaluation dimensions were sent to all vendors meeting the inclusion criteria, with 10 out of 11 vendors opting to participate. WorkFusion opted not to participate after receiving the ODM questionnaire, without citing any specific reason and we decided to exclude it from this evaluation. Ovum had thorough briefings with the final 10 vendors to discuss and validate their responses to the ODM questionnaire and understand the latest product developments, strategies, and roadmaps. This ODM includes observations/inputs from Ovum's conversations with IT leaders and RPA practitioners, including those conducted based on customer references provided by the vendors participating in this evaluation.

Technology assessment

Ovum identified the features and capabilities that would differentiate leading RPA platforms and vendors. The criteria groups and associated percentage weightings are as follows. Ovum will publish details on individual criteria groups separately.

- Development features and UX (weighting assigned =30%)
- Automation & execution capabilities (weighting assigned = 27.5%)
- Security, monitoring, and governance (weighting assigned = 27.5%)
- AI capabilities (weighting assigned = 15%)

Execution and market impact assessment

For this dimension, Ovum assessed the capability of an RPA platform/vendor across the following key areas:

- Product maturity & innovation (weighting assigned =25%)
- Scalability & enterprise fit (weighting assigned =30%)
- Product & GTM strategies (weighting assigned =30%)
- Market impact (weighting assigned =15%)

Appendix

Further reading

Key Factors to Consider for RPA Adoption, INT003-000146 (May 2018)

Using RPA and BPMS for Digital Process Automation, INT003-000150 (May 2018)

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Ovum Consulting

We hope that this analysis will help you make informed and imaginative business decisions. If you have further requirements, Ovum's consulting team may be able to help you. For more information about Ovum's consulting capabilities, please contact us directly at consulting@ovum.com.

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