



INSTITUTE FOR
ROBOTIC PROCESS
AUTOMATION

INTRODUCTION TO ROBOTIC PROCESS AUTOMATION

A Primer

Developed and written by
the Institute for Robotic Process Automation
in association with
Carnegie Mellon University

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A MESSAGE FROM IRPA FOUNDER
FRANK CASALE

HARD FACTS AND HYPE

The Data and the Drama Behind Robotic Process Automation



Imagine a world in which the meaning of “work” has been redefined for millions of people. Where our service economy can actually focus on *providing* services, delivered by an engaged talent pool that is innovating on such service. In this new world, work would no longer be a “four-letter word” associated with functioning within repeatable systems and mundane transactional processes. Instead, this other world would have workers who rethink end-to-end processes on a more holistic level with the goal of simultaneously impacting several factors: quality, compliance, functionality, best practices, regulatory functions, customer satisfaction, human error, and the all-important bottom line – all while continuing to create “the next” in the form of remarkable products and services.

If you’ve come to this book, it’s probably because someone you know has told you that, in fact, this is the world we are already living in – that 2015 is to robotic process automation (RPA) what 1994 was to the Internet – an auspicious start, but we ain’t seen nothing yet! Thanks to RPA, we are well on our way to doing the business of the future. However, none of us can really predict just how revolutionary it will be.

The mere mention of robots could conjure the worst nightmare of anyone who has read Aldous Huxley or watched “The Matrix,” but science fiction’s prediction that robots will become smarter than humans and make them obsolete has no place here. There’s a lot of hype and paranoia regarding what RPA is capable of, now and in the future, and what it will mean for labor arbitrage. As Founder and CEO of The Outsourcing Institute, I feel like this is déjà vu all over again. In the early 1990s, I sensed that outsourcing was going to be more than a passing trend, and despite its controversy, it became a pivotal strategy for companies seeking access to world-class capabilities and much-needed cost reductions. Outsourcing’s ability to have such a dramatic impact on cost reduction would make implementation for most organizations a no-brainer. It was apparent that as outsourcing grew, labor pools, locally and globally, would be impacted. Some people panicked, others were enraged, but no matter, the macro and micro economic effect was historical – yes, controversial – yes, political – yes, stoppable – *no*.

And as we look to history to help us predict the future, we cannot deny that automation, in particular robotic process automation, is today’s version of outsourcing – unstoppable. And as industry leaders and employees across all domains begin to run scared, there are many of us who are optimistic about the future of work: there will always be work, just a very different kind. As human beings live longer and retire later, it makes sense to work with RPA not necessarily to put workers on the unemployment line, but to retrain them in ways that makes sense for what we are capable of creating and producing in the 21st century. By looking to the future of work through the RPA lens, we can predict what kind of education, skills, and domains our children should be committing to and preparing for what is inevitable – robotic process automation is here to stay. In fact, there’s no denying that automation has been in our zeitgeist for quite some time – from the automated money counter that eliminated the bank teller’s error in cashing your check to the food choices available to you on an airline’s menu to the locations programmed in the GPS of your car, automation is not new, but ever-evolving.

“And as we look to history to help us predict the future, we cannot deny that automation; in particular, robotic process automation is today’s version of outsourcing – unstoppable.”

Will there be job casualties along the way? Absolutely. But the fact is, those companies that bury their heads in the sand and don't make the pivot, either because they don't want to or don't know how to, will suffer the same fate as the companies that just two decades ago didn't prepare for the shift to an offshore/outsourcing economy.

This primer has been written to help you become informed on how you might prepare to make the pivot, to understand better what RPA does and will do in the future, and learn how it can affect the redesign of processes and increase quality and value while decreasing costs.

Making the pivot to RPA is a decisive moment for service providers. The benefits of digital labor are rapidly eclipsing the benefits of physical labor, and service providers can choose or decline to translate that into success. I forecast that by 2020 as much as 40 percent of information technology outsourcing (ITO) and business process outsourcing (BPO) service providers will be out of business or acquired by larger enterprises, if they fail to embrace the change and reinvent their business models.

For the buyer community, RPA is appealing because it is quick and cost effective and doesn't send jobs offshore. It is my hope that our work at the Institute for Robotic Process Automation (IRPA), along with the information in this primer, will help business leaders on both the buyer and service sides position themselves at the cutting-edge of knowledge work technology, turning what they thought was a dystopic "humans need not apply" ending into a utopic beginning for the future of work.



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“The benefits of digital labor are rapidly eclipsing the benefits of physical labor, and service providers can choose or decline to translate that into success.”

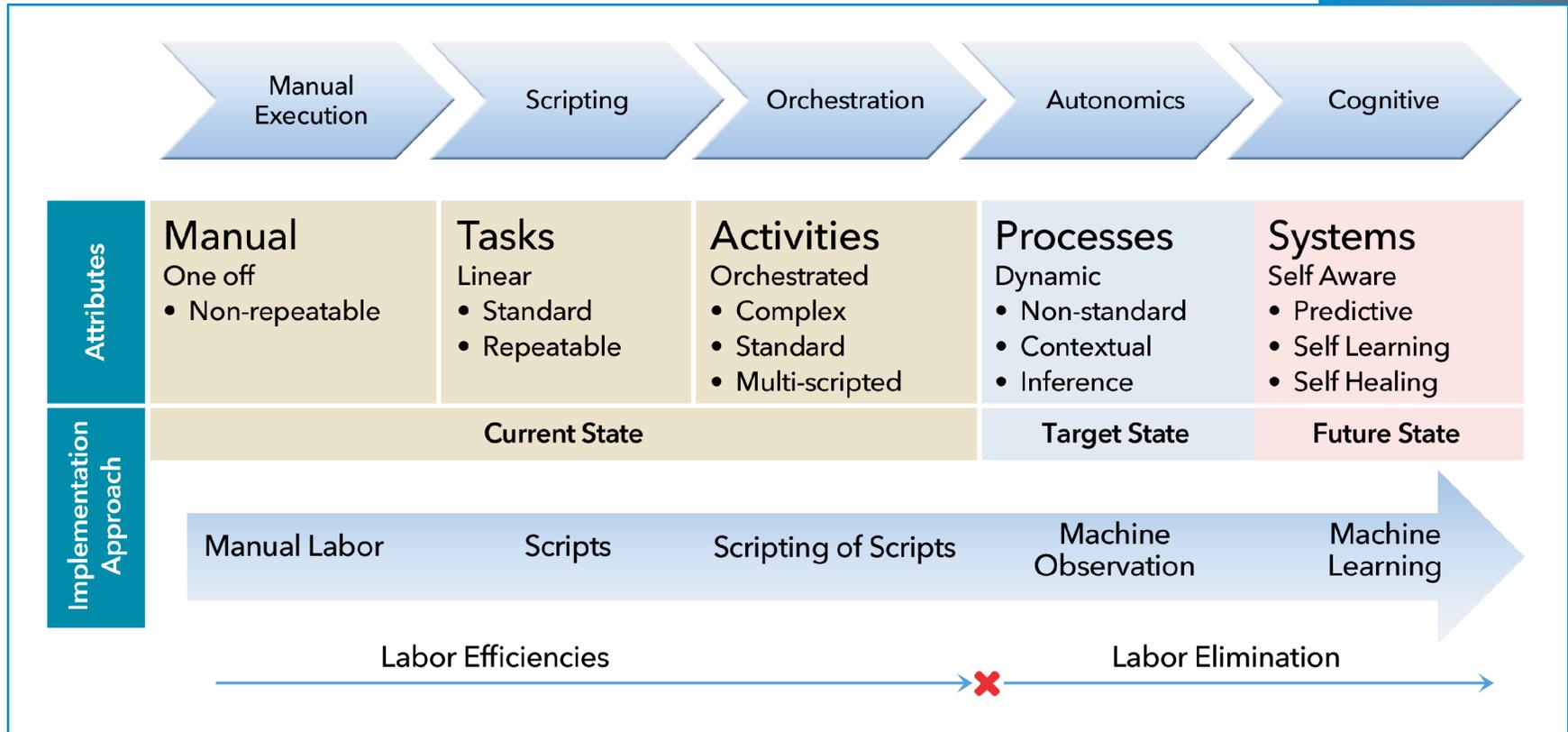
1

Beyond Pressing a Button The Automation of Automation

Labor automation is anything but new. But what does automation 2.0 look like? What is the difference between what we've seen robotically replace the work typically performed by human beings and robotic process automation (RPA)? While we typically think of traditional automation in terms of assembly line technology, ATMs, automated toll booths, and self-checkout counters, robotic process automation deals with "smart software" and the application of smart software to do high-volume, repeatable tasks that usually take humans an unbearable length of time to accomplish and which they typically find mundane to perform.

One of the debates surrounding RPA revolves around the question of whether this technology is truly revolutionary or simply the product of the evolution of other similar technologies. Many technologies, including artificial intelligence (AI), expert systems, and other methods of process automation have served as predecessors to RPA. That being said, RPA takes artificial intelligence and expert systems to an elevated level. Among leaders in the automation industry, robotic process automation is perceived as offering unique capabilities and advantages over previous technologies.¹

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What's So Great About What We Automate?

“Autonomics,” as IBM, and other organizations call it, gives any work process that is definable, repeatable, and rules-based the ability to map out a business process and assign a software robot to manage the execution of that process, just as a human would. RPA technology is not a part of a company’s information technology infrastructure, but rather sits on top of it.² This allows a company to implement the technology

quickly and efficiently without altering existing infrastructure and systems. Another way to look at RPA technology is to consider that it is not designed to be a business application, but designed to be a proxy for a human worker to operate business applications.³

When a bank in the United Kingdom needed a strategy to deal with its increase in high-risk accounts, robotic process automation was an attractive alternative because the technology allows a business process to be automated without changing existing company systems and framework. There are a number of high-risk customer accounts that must be reviewed daily, and these customers are listed in this “queue” because they have insufficient funds to cover scheduled and upcoming payments. Prior to the automation of this system, a team of eleven employees was assigned to clear this queue daily – approximately 2,500 accounts required manual review to determine whether or not the payments should be processed or returned. It took up to eight hours for these eleven employees to reach the end of the queue, and the risk of inconsistency and error was always present.

In hopes of improving the efficiency of the queue review process, the bank began to explore other options. It worked with a robotic process automation provider to implement an automation procedure within a few short months. This new procedure employs twenty virtual robotic employees that complete the queue review process exactly as a human would. With the implementation of this new software, the efficiency and accuracy of the process have increased dramatically.

Now, the same task that typically took eleven employees until 3 pm to finish is complete by 11 am. The automation software reduced the bank’s processing costs by 80 percent. The automation has freed the bank’s employees from dull and tedious tasks, thereby enabling them to be more proactive in their relationships with customers. Customer service practices have improved and customer relationships strengthened. The bank has been extremely pleased with the results of this RPA implementation and continues to analyze its business processes and functions for additional automation opportunities.⁴

“The automation software reduced the bank’s processing costs by 80 percent. The automation has freed the bank’s employees from dull and tedious tasks, thereby enabling them to be more proactive in their relationships with customers.”

While traditional automation can complete a rules-based, repeatable task, RPA takes automation a step further. Dubbed the “automation of automation,” RPA combines automation with the adaptability and awareness of artificial intelligence. This technology is able to learn and respond to problems that would have stumped traditional automation software. With adaptability and awareness, RPA is capable of automating activities that once required human judgment. These software robots are able to perform the tasks of knowledge workers whose jobs have (up until recently) been immune to the impacts of automation.

**“WITH ADAPTABILITY AND AWARENESS,
RPA IS CAPABLE OF AUTOMATING ACTIVITIES
THAT ONCE REQUIRED HUMAN JUDGMENT.”**

The difference between RPA and traditional business process automation could be likened to a driverless robotic car versus a car using cruise control. Cruise control simply modulates vehicle speed, while the driverless car is able to be aware, learn, adapt, and respond to various driving situations, as a human would. This adaptability and awareness is what gives RPA the edge over traditional business and information technology process automation technology.⁵

Awareness becomes a key characteristic of robotic process automation through the ability to conduct customer analytics, data mining, social media analysis, and the warehousing of big data, just like e-tailer Amazon works to further understand the behaviors, habits, and needs of its customers. As companies transition to robotic process automation, they will aggressively re-engineer themselves with these smart systems, thereby reducing the need for remote labor pools. They’ll also improve business processes and execute sophisticated and targeted data analytics with increased speed, quality, and scalability.

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“The difference between RPA and traditional business process automation could be likened to a driverless robotic car versus a car using cruise control.”

2

From Transactional to Analytical The Upsides of Robotic Process Automation

When Laura, who works in the purchasing department for a regional auto parts chain, began working with automated technology, she no longer had to spend her time doing manual inventory counts, submitting purchase requisitions, and processing credit verification, which saved her hours of paperwork and potential processing delays. But here's how RPA takes on a more analytical role than a transactional one: when inventory count is low, the software can be trained to trigger the issuance of a purchase requisition from the appropriate department. The sophisticated system even has the ability to interface with vendor systems to verify the availability of the inventory items that are needed. Finally, once requisitions are verified, purchase orders can be sent out by the system. And all of this is done automatically, without the need for Laura's involvement.

Decreased Operational Costs

In the last couple of decades, offshoring and outsourcing have become popular business tactics for decreasing operating costs. Labor in the United States is much more expensive than labor in the Philippines or India, for example. From 2000 to 2010, it was reported that U.S. multinational firms hired nearly 2.4 million offshore

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employees and cut 2.9 million jobs in the United States.⁶ Offshore has its costs, but the costs are not nearly as high as payroll within the United States. Remarkably, RPA technology has proven to cut the cost of an offshore full-time employee (FTE) in half.⁶



Follow the cost
save

Robotic process automation is creating a “shift beyond labor arbitrage,” or ShiBLA as I refer to it, and is reducing labor costs by 25 to 40 percent in both IT and business process environments.

While many companies, large and small, will find RPA decreases their need for human labor, diminishes processing times, and ignites the ability to easily interface with foreign systems valuable to their bottom lines, there are many other benefits of RPA. For instance, RPA changes the rules of the game by allowing organizations to continually monitor business or IT processes and the behavior of personnel and software applications as part of those processes. That monitoring of patterns and events is performed by virtual engineers (robots) that can actually learn by observing process-based activities undertaken by human engineers. The subsequent knowledge gathered through machine observation can then be incorporated into future computer inferences made during operations. Not only can RPA be used to identify an anomaly,

thereby turning workers into problem solvers, it can also initiate a set of action items to respond to the occurrence.

A globally recognized insurance firm in the United States was in the process of transitioning its data and systems to a private cloud infrastructure. This infrastructure needed to have the capability to scale virtual machines up and down as needed. The existing system that deployed and managed these virtual machines was highly reliant on human assistance. It quickly became apparent that a more autonomic (self-learning, self-healing) system was required to support the company's expanding infrastructure.

The solution combined virtualization technology with autonomics to craft a flexible system that is capable of scaling up or down by thousands of virtual machines on a daily or even hourly basis. Not only are the virtual machines auto-deployed, they are self-monitoring. Even the backup management has been automated. This greatly reduces the amount of human intervention required while also eliminating errors during the process.

The insurance company was able to implement this solution in three office locations within 120 days, allowing them to make the transition to the new infrastructure twelve months sooner than expected. This unique solution has enabled the insurer to guarantee 99.99 percent availability of its critical systems.⁷

Improved Data Analytics

Each task the robot executes produces data that, when gathered, allows for an analysis. This drives better decision making in the areas of the processes being automated. When data is efficiently combined, compared, and contrasted to data collected in other areas, it allows for better decision making on both a micro and macro level. As each step in a process is traced, a company is able to identify gaps where processes could be further optimized to increase efficiency.

“It quickly became apparent that a more autonomic (self-learning, self-healing) system was required to support the company's expanding infrastructure.”

Increased Regulatory Compliance

The nature of automation means that each step in an IT or business process is fully tracked and documented within the system that is being automated. This makes a company become more compliant with industry and audit regulations. RPA is a lifesaver for industries that have functional areas highly regulated by strict compliance guidelines, such as healthcare, banking, and insurance. In an RPA-enabled scenario, the solutions will provide in-depth telemetry/data about workflow, thus enabling tremendous insight and documentation to comply with specific regulations.

Increased Efficiency

A software robot never needs time off – it can work twenty-four hours a day, seven days a week, and 365 days a year. It doesn't call in sick or take a vacation. Typically, a single software robot can replace two to five full-time employees, possibly more. The same volume of work can be done in less time, or more volume can be processed in the same amount of time, thereby allowing downstream work to commence sooner.

Higher Employee Productivity

As software robots handle the more repetitive, tedious jobs in a business, employees can participate in more value-added activities that involve personal interaction, problem solving, and decision making. Robotic process automation allows employees to complete tasks that are more valuable to the company and its customers. When employees feel their work is valued and worthwhile, their productivity increases, which increases

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employee retention rates. But beyond being able to participate in more value-added activities, employees are better supported for their value-added tasks. This can help increase productivity. Again, the same volume of work can be done in less time, thereby allowing downstream work to commence sooner.

Improved Accuracy

Employees are human, and all humans make mistakes. A compelling feature of RPA is its capability to virtually eliminate processing errors. It's not a turn-key solution. There will still be the need for testing, training, and governance, but as long as a process is properly optimized and all its sub-processes are accurately mapped, a business need not worry that its software robots will make the mistakes that its employees might.

Increased Customer Satisfaction

As employees move to more customer-facing roles, and as automation makes processes more efficient and error-free, customers are likely to become more satisfied with their experience. As a company improves its relationships with its customers, customer satisfaction, retention, and acquisition will improve as well.

Logistical Upside

Transitioning to RPA will minimize or eliminate complications with offshore labor as it relates to time zone differences and cultural and language barriers. Using RPA can also decrease the need for employee recruitment and training costs.

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RPA and Business Processes

Technologies like presentation-layer automation software – a technology that mimics the steps of a rules-based, non-subjective process without compromising the existing IT architecture – are able to consistently carry out prescribed functions and easily scale up or down to meet demand. Process automation can expedite back-office tasks in insurance, finance, procurement, supply chain management, accounting, customer service, and human resources. It could also perform duties including data entry, placing purchase orders, creating online access credentials, and completing business processes that require “swivel-chair” access to multiple existing systems.

IT Support and Management

Automated processes in the remote management of IT infrastructures can consistently investigate and solve problems for faster process throughput. Robotic process automation can improve service desk operations and the monitoring of network devices. Separating scalability from human resources allows a company to handle short-term demand without extra recruiting or training. Additionally, IT management will be more effective because RPA makes it easy to maintain a scalable infrastructure. In short, it's easier to scale software than it is people.

**“RPA WORKS WELL IN ANY INDUSTRY
WITH DEFINABLE, REPEATABLE,
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RPA Versatility

One of the most powerful benefits of RPA technology is the scope of its usability across various industries and its ability to complete a variety of tasks. For a particular task to be a good candidate for automation by RPA, it must be definable, repeatable, and rules-based. Once these conditions have been met, the software's flexibility allows companies to be creative in the tasks they choose to automate. These tasks might include closing and opening accounts, completing requests for proposals, handling various processes in the billing and customer service departments, or IT systems testing and monitoring.

While RPA works well in any industry with definable, repeatable, and rules-based processes, certain industries are more compatible for the technology, such as healthcare, banking, and insurance industries, because they all dedicate significant numbers of labor hours to the tasks that could be handled by software robots. Robotic process automation can excel at operating multi-step tasks across multiple systems including, but not limited to, the following:

- fraud chargeback processing
- low-risk arrears review
- medium-risk arrears review
- direct debit cancellations
- personal account closures
- payment processing
- internet application processing
- business account audit requests
- business account onboarding
- excess transaction approvals
- excess check approvals
- excess customer letters

“One of the most powerful benefits of RPA technology is the scope of its usability across various industries and its ability to complete a variety of tasks.”

- amend standing order details
- amend direct debit details
- amend address details
- transaction duplication
- right of set off
- automated fraudulent account closure process
- automated branch risk monitoring process
- personal loan application opening
- new loan product blitz
- data cleansing
- payment protection insurance claims processing
- automation of the administration of payment terms
- automated support for sale of insurance products
- automated marketing campaigns
- customer complaints automation
- compliance reporting automation
- insurance product administration automation

“For a particular task to be a good candidate for automation by RPA, it must be definable, repeatable, and rules-based.”

3 The End of Outsourcing? A Call for a New Synergy

The University Hospital Birmingham (UHB) National Health Service Foundation Trust implemented RPA technology to reduce the time it took to register patients. The goal of the project was to create an efficient, easy, and intuitive patient registration process through the implementation of registration kiosks. These kiosks needed to be able to access the National Program of IT Patient Administration System (NPfIT or PAS) in accordance with the NPfIT security policy. This system would also need to be operational within a very short timescale in advance of the opening of a new hospital.

As the Trust explored different options for system operation, it realized that traditional IT approaches would require deep access to the PAS and would not be in accordance with the NPfIT security policy. Robotic process automation technology, however, had the ability (without this deep connection) to access the system rapidly while staying in accordance with the security policy – and did so within the required timeframe.

As the patient registration kiosks were implemented at the hospital, the results were positive. More than half of all patients registered with these kiosks, patient flow moved through reception twice as quickly, and staff became 50 percent more efficient. Patients reported high satisfaction with the kiosks, noting that they were fast and easy to use.⁸

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These patient registration kiosks turned out to be just a starting point for robotics process automation at University Hospitals Birmingham. After the success with utilizing RPA technology with the kiosks, the hospital began to apply it to other business processes. The hospital created an RPA system to keep the “Patient Master Index” current. Through this process the UHB was able to automatically cancel appointments for recently deceased patients, keeping the hospital from unnecessarily holding spots and making potentially upsetting appointment reminders. Some of the other processes automated by the hospital include pharmacy stock control updates, outpatient appointment outcomes, job transfer data, and system monitoring.⁹

What I’ve observed time and again is the company that employs robotic automation quickly gains a competitive advantage. Whether it is used to create a virtual back office, an IT infrastructure, or to do any type of work that is definable, repeatable, and rules-based, digital labor hikes efficiency, improves data assets from advanced analytics, and causes a dramatic uptick in operational speed and performance. Additionally, those who embrace digital labor will yield lower costs by 25 to 40 percent, as illustrated by the story just told.

Robotic process automation has the ability to operate within a company and interact with human employees as either independent automation or assisted automation. Independent automation does not require human intervention. Assisted automation, however, still requires human assistance for decision making. Take an ATM machine as an example of assisted automation. While the ATM machine itself processes functions such as cash withdrawal and balance inquiry, the system still requires human input to function.¹⁰

There are many opportunities for RPA robots to work alongside human workers as assistants, and knowing this fact will help call for a new work synergy, one between human and robot. For example, while a customer service representative may be communicating with a client, that representative may use this assisted automation technology to access necessary information about the client, fill an order, or communicate data between the front and back offices.

“What I’ve observed time and again is the company that employs robotic automation quickly gains a competitive advantage.”

What's Next for Outsourcing?

This will not necessarily be the end of outsourcing, as I discussed in my white paper “Here Come the Robots,” but there is reason to believe that this will be the end of outsourcing as we know it because businesses will be less dependent on traditional outsourcing parties.¹¹

A big question surrounding the RPA industry is what impact it can have on outsourcing buyers and providers offshore, onshore, and near shore. There will be a significant reduction of full-time employees (FTEs). Conservatively, we can assume that one robot will replace at least two humans; a more realistic estimate would be that three to five humans could be replaced by a single robot.¹² These jobs, however, will be affected more offshore, in countries such as India and China.¹³ This will also provide a huge opportunity for business process outsourcing (BPO) providers. They will be able to acquire new and different customers as well as help clients find a balanced blend of FTEs and robots.¹⁴ Instead of RPA replacing humans, it will be enabling and elevating them. RPA provides a faster approach to the entire process at hand. Instead of taking the time to outsource and see where the cheapest labor can be found, RPA will enhance speed and cost effectiveness.¹⁵

“Instead of RPA replacing humans, it will be enabling them.”

“RPA PROVIDES A FASTER APPROACH TO THE ENTIRE PROCESS AT HAND. INSTEAD OF TAKING THE TIME TO OUTSOURCE AND SEE WHERE THE CHEAPEST LABOR CAN BE FOUND, RPA WILL ENHANCE SPEED AND COST EFFECTIVENESS.”

**Impact on the Marketplace:
THE GOOD, THE BAD,
AND THE UGLY**

There is only one thing better than a low-cost person performing a business function—having no person at all. The new breed of RPA-infused outsourcing solutions will be less about people and more about advanced automation technology. Is this good news or bad news? Depends on who you are.

THE GOOD	It will be good for all enterprises whose existing outsourcing relationships have run out of steam; it's an aid to those struggling with new and incremental cost save and innovation and are seeking a silver bullet. Why struggle to gain another 5-10% labor cost reduction when you can easily enjoy labor cost saves of 25-40% or more? For regulated businesses, the analytics and reporting will be like nothing you could have envisioned in a traditional outsourcing engagement. In environments where speed and scalability are key, RPA will deliver in spades.
THE BAD	It will be bad for most IT, ITO, and BPO providers as the new math will have market prices plummeting. Traditional labor-based pricing will not stand a chance. What will you do when your lowest "buy the business" pricing isn't even in the ball park?
THE UGLY	It will get ugly for Indian offshore players who heretofore have made history and surpassed even the most optimistic growth predictions over the past two decades based on a labor arbitrage model that is about to become extinct.

BUYERS	Take the initiative to educate yourself and your peers as to what RPA is, who is doing it, who the experts are, and who the providers are. You should insist that your current providers embrace RPA and transform their model so that you may gain the benefits sooner versus later.
ONSHORE PROVIDERS	It's all about the pivot. Bad news is that this will be painful for some and impossible for others. The good news for those who make it is that you will very soon have the opportunity to win back all that business that you lost to offshore competitors.
OFFSHORE INDIAN PROVIDERS	Many have been predicting the end of Indian IT for years. Could this finally be it? Your strength is now your weakness. The bigger and more vested you are in a low-cost labor arbitrage model, the tougher it will be for you to make the transformation. You will have two choices: 1. Lay off many thousands and rapidly change what and how you sell or 2. Stick with the current plan and see how it plays out. As you watch the market change direction, you'll notice that with option 2 you'll see damage to your market share and market cap, making all those layoffs inevitable in an attempt to rebound from a much weaker position.

Advice and Recommendations

What I learned from being among a handful of people at the forefront of the outsourcing mega-trend twenty years ago, is that disruption is exciting and does tend to benefit many, but it is also painful and damaging to others. There are always winners and losers and there certainly will be many of both in this emerging and powerful wave of robotic process.

This graphic can also be found in the IRPA white paper "[Here Come the Robots.](#)"¹⁶

The Good, the Bad,
and the Ugly

4 Welcome to the Future Robotic Process Automation Is Here to Stay

Experts in the BPO and IT spaces know that robotic process automation has the potential to revolutionize the way we do business. What does the future hold as RPA becomes more and more prevalent in the business world? A report on emerging disruptive technologies published by McKinsey & Company estimates that as the use of disruptive technologies like RPA grows at the rate it is expected to, as many as 110 to 140 million FTEs could be replaced by automation tools and software by the year 2025.¹⁷

As companies become familiar with this powerful, emerging technology, people will quickly understand the benefits it offers over outsourcing and other methods of business and IT processing. Perhaps crowdsourcing and impact sourcing will play a large role as RPA technology becomes more sophisticated, and new jobs will potentially be created for human workers with the advanced skills needed to maintain and improve this technology. In other words, as we move toward the future, humans will work hand-in-hand with robots to transform the way we do business, resulting in lower costs, increased efficiency, and improved customer service and employee fulfillment.

“ . . . as we move toward the future, humans will work hand-in-hand with robots to transform the way we do business . . . ”

Expanding RPA from transactional processes to more analytical ones, many people are banking on the future of RPA being on the cognitive side – the ability not only to adapt and assess, but interact and iterate, possessing the ability to understand contextual element. In short, RPA would operate just as a human brain would and maybe even beyond it.

“In short, RPA would operate just as a human brain would . . .”

Beyond RPA: The Cognitive Computing Revolution

“PEOPLE ARE BANKING ON THE FUTURE OF RPA BEING ON THE COGNITIVE SIDE – THE ABILITY TO NOT ONLY ADAPT AND ASSESS, BUT INTERACT AND ITERATE, POSSESSING THE ABILITY TO UNDERSTAND CONTEXTUAL ELEMENT.”

Using artificial intelligence (AI) and machine learning algorithms, cognitive computing systems are trained, not programmed, to function as the human brain does, performing cognitive tasks from sensing, predicting, inferring, and even having an emotional intelligence.

Unlike traditional automation, which required a human expert to hard code a script or workflow into a system, cognitive computers can process natural language and unstructured data. IBM is already out there with Watson, it's version of the cognitive “agents” that can learn by experience. Cognitive computers have been developed with the intent not to replace human experts, but to work in tandem with them to support decision making and assist these experts in producing more informed and better decisions across various domains – from health care and insurance to finance and customer service. For instance, as Watson learns

to become adept at offering guidance to people looking for financial advice, human financial advisors will have time to hone their investment strategies, which increases the confidence of investors because they will know that instead of their advisor making bias decisions or giving advice on a whim, they have access to hard data and deep analysis.

In scenarios like that, humans and machines work together. The cognitive agents use image and speech recognition to understand and interact with the world and therefore more cohesively with humans. These agents even provide feedback loops for machines and humans to learn from and teach one another. Cognitive computers can display data that is visually palatable and guides humans to the data they need in order to make finer decisions.

The quality of service that some of these cognitive agents offer is one of the standout achievements of the technology. Whereas many other technologies demand that humans adapt their behavior in order to interact with “smart machines,” cognitive software is intelligent enough to interact like a human, equipping it to deliver top-notch customer experiences.

It has been said that dull and unfulfilling tasks take up about 80 percent of people’s day-to-day lives. By using technology that mimics human behaviors, humans can be free to redirect their talents toward actions that have higher value results.

“COGNITIVE COMPUTERS HAVE BEEN DEVELOPED WITH THE INTENT NOT TO REPLACE HUMAN EXPERTS, BUT TO WORK IN TANDEM WITH THEM TO SUPPORT DECISION MAKING AND ASSIST THESE EXPERTS IN PRODUCING MORE INFORMED AND BETTER DECISIONS ACROSS VARIOUS DOMAINS.”

“We are not trying to sell a specific solution. We are building a general purpose machine that other workers can set up themselves and work alongside.”

—RODNEY BROOKS

In a recent [Wired](#) magazine article titled “Better than Human,” Rodney Brooks, former MIT professor and designer of a revolutionary new workbot from Rethink Robotics, said, “We are not trying to sell a specific solution. We are building a general purpose machine that other workers can set up themselves and work alongside.”

The day will come when human and robot tasks blend, leading humans to create new work of which we aren't yet aware. Kevin Kelly, author of the *Wired* article posited, “We aren't giving ‘good jobs’ to robots. Most of the time we are giving them jobs we could never do. Without them, these jobs would remain undone.” The article went on to say, “Ninety percent of your coworkers will be unseen machines. Most of what you do will not be possible without them. And there will be a blurry line between what you do and what they do. You might no longer think of it as a job, at least at first, because anything that seems like drudgery will be done by robots. Let the robots take the jobs, and let them help us dream up new work that matters.”

“The day will come when human and robot tasks blend, leading humans to create new work of which we aren't yet aware.”

5 Revving to Go A Roadmap to RPA Success

Depending from where you are approaching RPA – the enterprise/buyer side or the service provider side – your implementation strategy will encompass three action items:



1. Learn

The esoteric and ever-evolving area of RPA gives many companies and service providers pause. Discovering more about how RPA works and whether it can work well in certain environments takes a good amount of research. White papers are a good source of information because they will present this complex issue concisely and from the author or institution's viewpoint. However, white papers may only show one perspective. From an economist's standpoint, RPA may be the devil, but to a writer for, say, *Wired*, it may be a salvation. Getting the full picture in terms of opinions and facts and learning who the thought leaders in the field are will help build confidence in moving ahead. And while internet searches, podcasts, webinars, and YouTube

Learn

Prove

Operate

videos will provide more of what white papers offer, attending conferences can assist in moving from the theoretical to contextual. Furthermore, researching case studies similar to your situation will offer terrific scenarios that can add to the richness and specificity as you compare and contrast cost and quantitative benefits. Finally, inviting in a third-party expert who can consult and assist in implementation will help you move from the sole idea of RPA to understanding it in the context of your environment, as well as understanding how RPA differs from traditional automation and what it can or cannot do for you. Third-party experts also bring a vast range of experience that can speak to unforeseen pitfalls, risks, or mistakes that otherwise might go undiscovered until it's too late.

2. Prove

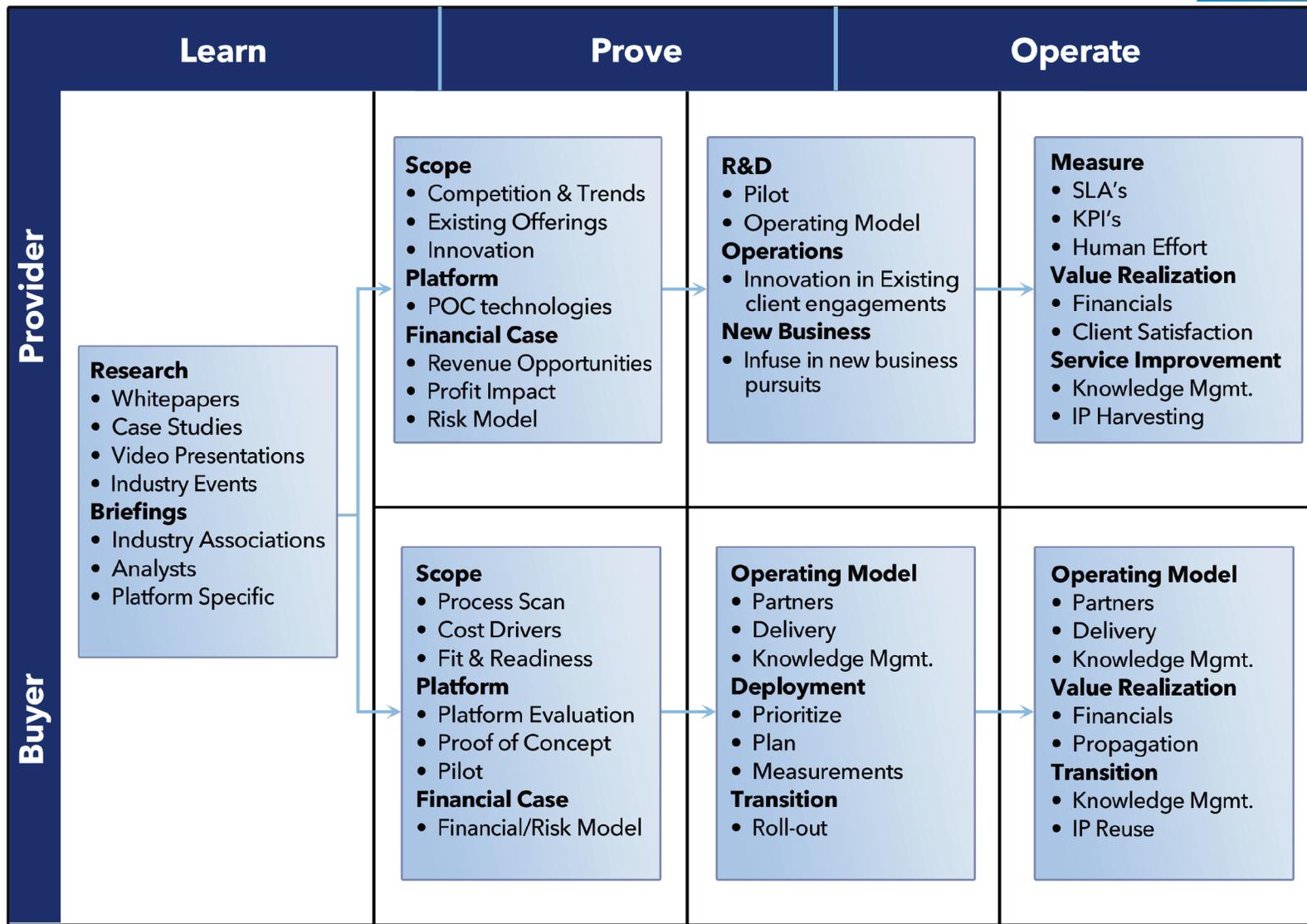
How do you assess your readiness before going forward with a full strategy? Recruit the most accurate human resources for the establishment and maintenance of RPA. An academic researcher on the subject, Fung Han Ping, states, "The IT organization needs to assess the skill – if RPA proves to be successful in a trial run, then a company can begin to invest in RPA technology for more intricate and complicated processes."

3. Operate

This is the phase when obviously you are in operation, with possible plans to roll out robotic process automation throughout the larger company; however, this must never be considered the end point. Technology changes rapidly, and there will be the need to refresh tech and pricing as part of your continuous improvement.

Gone are the days when workers will transfer knowledge to new employees. The use of RPA allows people to be up to speed right from the start.¹¹

"Gone are the days when workers will transfer knowledge to new employees. The use of RPA allows people to be up to speed right from the start."



6 In Review

What to Take Away from RPA

- 1.** RPA takes artificial intelligence and expert systems to an elevated level. What distinguishes this type of technology from traditional automation is its ability to be aware and adapt to changing circumstances or new situations.
- 2.** RPA technology is a good candidate for almost any organization that has many different, complicated systems that need to mesh together. The healthcare, finance, insurance, and banking industries are particularly ideal.
- 3.** RPA technology offers companies an alternative to outsourcing, which often results in lower operating costs, decreased cycle times, and increased productivity.

- 4.** RPA technology tracks and monitors all tasks that it automates, therefore it enables companies to become more audit and regulatory compliant and to deeply analyze company processes. Thanks to the software's ability to adapt, self-learn, and self-correct, a company can further optimize its business processes using RPA technology.
- 5.** It is important to optimize a business process itself prior to automation. As a pilot test, the company should automate a smaller, low-risk task. If the test proves to be successful, the company can begin to automate entire end-to-end processes and IT functions.
- 6.** Though it is expected that automation software will replace up to 140 million full-time employees worldwide by the year 2025, many high-quality jobs will be created for those who are able to maintain and improve RPA software.
- 7.** As more and more companies adopt RPA, it must be combined with other processes and technologies to optimize the benefits it yields. With time, this revolutionary technology has the potential to optimize and improve processes throughout the entire business world.

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