Cognizanti

An annual journal produced by Cognizant
VOLUME 9 • ISSUE 1 2016

Part III

Digital Business 2020:

Getting there from here!

Bots at the Gate

Intelligent Automation: Where We Stand – and Where We're Going

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By Matthew Smith

By seeing intelligent automation through a 'do, think, learn' and ultimately 'adapt' framework, businesses can begin benefiting from this powerful set of technologies now.

Ever since the first mainframes were installed, automation has been a hot topic in the business world and a source of fascination in the public imagination. The focus has shifted over the decades, from automation of tasks, to data center operations, to entire processes.

In 2011, robotic process automation (RPA) officially claimed front and center of the business stage and quickly became a dominant topic for industry observers and participants alike. Across Twitter, blogs and other social media, the RPA story caught fire, and an array of automation experts appeared overnight, ready to help companies reap the benefits of this "newly discovered" technology.

The idea was compelling: non-programmers able to hard-code business rules into software that could be triggered by particular events to execute a computer-based process previously performed by a human. But as has often been the case in automation's rich history, opinion was divided. While some in IT dubbed it as just "macros on steroids," others foresaw the end of the workforce, and civilization, as we know it.

Little wonder, then, that many today are questioning where society and business currently stand – and where we're going – with automation, especially with related advanced technologies like natural language processing, machine learning and other cognitive computing capabilities appearing on the scene.

No matter which perspective you take, the fact is that forward-thinking businesses are taking advantage of RPA and advanced forms of intelligent automation – right now – that will result in step-changes in their performance, agility and competitive capabilities. We believe that the use of intelligent automation will ultimately elevate the human role in operations by enabling

workers to emphasize their uniquely human capabilities. The need for business leaders to understand the real opportunities and chart the best path forward is more of a priority than ever.

In actuality, it's much more informative to predict not the faraway future of automation but what will happen in a mere 12 months from now. That's why we've set out to consider the state of automation – and specifically intelligent software automation – by the summer of 2017, just three years short of the journey to 2020.

Introducing Systems that Do, Think and Learn

In our estimation, RPA is vitally important to understand, as it's the starting point for what we see as the evolution of automation, from systems that "do," to systems that "think," to systems that "learn" and, ultimately, "adapt" (see Quick Take, next page). Organizations today are investing much time and effort in the first category, of which RPA is a great example.

Systems that Do

It's true that RPA saw its share of hype, extreme expectations and undue concerns, with claims it would cut delivery costs in half, leave workers without jobs and kill off the sourcing industry altogether. Today the hype continues, with a recent study proclaiming, "Software Robots Can Reduce Operating Costs by 90%."[1] But as with most over-hyped technologies, the reality is somewhere in the middle.

Without getting overly technical, automating processes with most RPA tools is more like creating traditional flowcharts than writing code, especially when screen and keystroke recorders are employed to make it even easier. Once built and tested, libraries of automated tasks can easily be reused or quickly customized to make future automations go faster. Meanwhile, teams of "virtual RPA workers" can be scaled up or down instantaneously or, even better, autonomously, as task volumes ebb and flow.

Business tasks ideal for RPA include loan application processes, claims adjudication, accounts payable and receivable, invoice reconciliation, data entry/extraction and report generation. Essentially, any rules-based, multi-application activity is likely to be a viable RPA candidate.

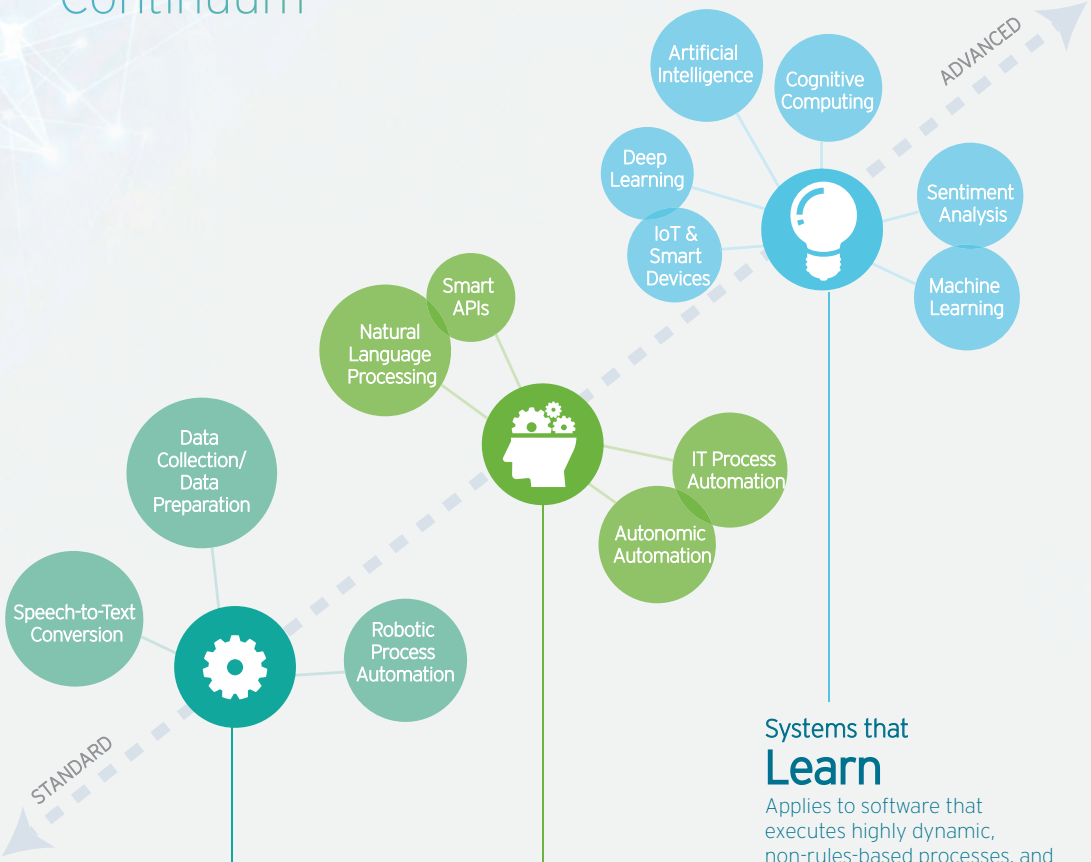
While RPA has yet to live up to the hype surrounding it, it is far more flexible and secure than macros are, scales quickly and is relatively low-cost compared with traditional business process management systems. Business users with minimal development skills can automate many types of work processes in just weeks or a couple of months at most. Getting the same thing done using traditional automation technologies, such as business process management suites, custom APIs or even complex macros, could take overloaded IT teams multiple quarters to complete, assuming they could even get the project funded and scheduled.

Essentially, RPA defines the first stage – the "do" stage – of where we are with automation today. In some ways, it's a modest advancement: While the technology is neither complex nor difficult to master, it is taking organizations far more time to reach RPA scale than was expected. There are several reasons for this, as getting RPA right for most companies means understanding the automation vendor landscape, reviewing and prioritizing processes, launching pilots and proofs of concept and, finally, determining the ideal model that will best support them in the long term.

Gradually, however, the early adopters are creating lessons-learned for others to follow, and best practices are beginning to emerge. The other change that will accelerate RPA adoption is the shift by many full-service providers to deliver more industry-oriented offerings tailored to the unique needs of sectors such as banking, healthcare, life sciences, insurance, etc. Other provider changes will be the introduction of more "out of the box" solutions and even automation-as-a-service – all of which require less customization and implementation time than do-it-yourself RPA.

Quick Take

Illuminating the Automation Continuum



Systems that Do

Corresponds with software that replicates repetitive, rules-based human actions.

Example processes:

- Claims processing
- Accounts payable/receivable
- Record or account data reconciliations
- Data consolidation/validation

Systems that Think

Refers to software that can operate more dynamically, making decisions autonomously when variances are encountered.

Example processes:

- Service desk incident resolution
- Complaint management and resolution
- Network security management
- Customer service and support

Systems that Learn

Applies to software that executes highly dynamic, non-rules-based processes, and can make optimal adjustments when variables change.

This category will ultimately evolve to "systems that adapt," enabling a rich partnership between humans and software bots.

Example processes:

- Prescriptive pricing engines
- Virtual service agents services
- Retail engagement systems

Systems that Think

While organizations are investing much time and effort into understanding and applying "systems that do," the real excitement is around what's coming next, as systems that "think" and "learn" become more prevalent. Whereas RPA systems can work only with structured inputs and hard-coded business rules, the next level of automation – systems that think – are able to execute processes much more dynamically than the first horizon of automation technologies.

The big advantage with automation technologies that think is the introduction of logic, which allows these programs to make decisions autonomously when they encounter exceptions or other variances in the processes they execute.

If you look at IT service automation as an example, these systems can analyze a user-generated request or trouble ticket for keywords or other triggers, and then based on embedded algorithms and logic, they can make decisions about prioritizing and addressing each case. Even better, their performance improves over time as they develop comprehensive histories of resolution data, which they can apply to improve future decision-making. These thinking systems deal far more effectively with less defined processes and unstructured data, and in this way they differ from RPA and other systems that "do," which operate best with defined, rules-based processes.

Natural language processing (NLP) is another example of an automation technology that thinks. NLP is a fast-evolving form of software automation that can interpret spoken or written communication and translate it into executable actions to be taken by the system. Smartphones increasingly rely on NLP for hands-free use, and call centers increasingly deploy NLP-based automated agents to help them handle more calls with greater efficiency, scale and consistency.

Systems that Learn

Looking at the third horizon in our intelligent automation continuum – systems that learn – we see a range of fast-evolving technologies that are characterized by their ability to analyze vast amounts of dynamic and unstructured input, as well as execute processes that are highly dynamic and non-rules-based. As an example, machine learning improves the diagnostic capabilities of medical imaging systems, enables online retailers to create highly-individualized catalogs and enhances the ability of software companies to test for security vulnerabilities in future application releases.

These learning systems are also adaptive, in the sense that they can apply one set of rules in one situation and then make optimal adjustments when variables change, such as location, resource availability or the presence of suspicious activity. In the enterprise world, imagine systems that learn running in tandem with work conducted by research and development teams, sales organizations, manufacturing and logistics operations, or customer service departments. Data-intensive processes and decisions predicated on understanding several complex variables and large volumes of information could move at machine speed and produce far more accurate, reliable and timely results. The impact – on everything from financial

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trading systems, to real-time pricing engines, to patient care, to completely individualized insurance programs – is enormous, and is just beginning to be recognized by early adopters.

What is most important to understand in terms of the intelligent automation continuum is that every organization has a vast opportunity to apply all the technologies of do, think and learn to improve business processes, accelerate outcomes, increase data quality and enable powerful and predictive analytics. Even more powerful than this digitization of work is the ability of these technologies to elevate the human role in operations. People are now more empowered than ever to do what we do well: think creatively, problem-solve, prioritize and interact with clients, partners and coworkers in smarter, more productive ways.

Automation Circa 2017

By 2017, here's where we believe organizations will be, in terms of their adoption of intelligent automation:

- **Automate first.** Rather than looking at wholesale system changes, process reengineering or complex studies, companies will realize that intelligent automation can be tried, tested and scaled in very short cycles. They will choose to automate first and begin capturing the benefits right away, while in parallel taking the time to consider the costlier and more complex approaches to creating efficiency, such as rebuilding or replacing underlying systems, developing new applications and redesigning end-to-end processes.
- **Automate ambitiously.** Intelligent automation will span many technology approaches and address a wide variety of process challenges, from low-volume to high, simple to very complex, structured to unstructured, and rules-based to dynamic. Companies will take a multidimensional approach to applying intelligent automation and will apply it ambitiously and in parallel to back-, middle- and front-office processes.
- **Automate with purpose.** The ability for intelligent automation to drive new types of outcomes will be well understood by mid-2017. We already see evidence of this as existing manual processes are reborn with automation and wend their way into the market. Well-known use cases now exist in areas such as loan handling, claims processing, order management, invoice reconciliation, service desk event management and others for which automation has dramatically reduced cycle times, error rates, cost per transaction and data quality issues. That awareness and insight will inform the benchmarks by which implementation success will be determined, rendering the incremental successes delivered today by "systems that do" inadequate.

As time goes on, we expect embedded intelligence to become table stakes, even in consumer technologies. Imagine your cable TV set-top box without DVR or your smartphone without a voice-activated personal assistant. Expect similar transitions to occur in automation as today's "systems that do" vendors build or buy their way to smarter technologies. This change will make implementations faster and easier, extend applicability to more dynamic processes and improve outcomes by creating fewer exceptions, improving output data and further compressing cycle times.

Systems that Adapt

We also expect the automation continuum to take on a new dimension, which we call "systems that adapt." As the technologies that enable intelligence become more pervasive across the ecosystem, the "systems

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that do" horizon will become narrower and less useful. "Systems that think" will become the entry tier as learning systems become mainstream.

By mid-2017, the do-think-learn model will shift to think-learn-adapt, as the current systems that learn gain additional self-awareness and begin to apply that learning to provide smarter, more effective outcomes. Systems that adapt will be characterized by their ability to modify themselves or optimize performance depending on changes to their environment; divert or defend themselves from security threats; and interact more seamlessly with other systems and the people they serve and support. The adaptive realm will see an even greater degree of interaction and partnership between humans and software "robots" that augment our work and personal lives.

Starting Your Automation Journey

Shifting back to today, business leaders have no choice but to embrace automation, as it is already playing a role in their organization's future. Taking a wait-and-see stance is not an option when systems that do, think and learn are already fast at work helping competitors, markets and whole industries reposition themselves for the "fourth industrial revolution" now upon us.[2]

To help chart their path forward, organizations should consider three different approaches to moving toward adopting intelligent automation.

- **Think big, scale fast:** With this approach, organizations identify automation as a top strategic initiative across their entire enterprise. They appoint an experienced executive to assume the role of automation leader, with the responsibility of accelerating the adoption of intelligent automation simultaneously across both IT and business operations. A life sciences organization we work with has taken this approach; the company has established a joint internal/external team of automation experts but plans to ultimately formalize its own internal automation practice that is capable of moving at the speed and coverage the business believes will be necessary.

  The team first prioritized just three unique processes that allowed the organization to begin developing experience in several different "do, think and learn" technology categories. The processes they chose – complaint management, invoice processing and report generation – allowed them to explore first-hand the capabilities of RPA, natural language processing, machine learning and intelligent image conversion. Based on those early learnings, the team has now developed an automation roadmap for the next 12 months that will encompass more than three dozen process areas across five different functions.

- **A winning partnership:** No organization has the capacity to learn about, absorb and manage all things automation-related. Businesses will need strong partners that can help them quickly assess and take advantage of potentially game-changing but little-known intelligent automation technologies, often offered by small, emerging vendors. We worked with a multinational financial services company to deploy an intelligent automation system across large-volume, rote and rules-based processes in its market research and supply chain operations. We benchmarked the vendor's technology, validated the product's capabilities and then supported the design, testing and deployment of the automated solution into the client's operations. In one process, post-automation cycle times decreased from a 15-minute average to 30

seconds. In the other, throughput increased by 50%, while required full-time equivalents (FTE) decreased by 72%.

By leveraging a partner's industry expertise and specific knowledge of the company's operations, processes and systems, businesses can reduce the risk of integrating innovative technologies into their environment.

- **Automation on-demand:** Some organizations have no intention of becoming automation experts but still want the benefits provided by intelligent automation. We worked with a healthcare payer to implement an as-a-service approach to quickly and accurately process out-of-network claims. The technology in this case is our intelligent automation platform with "do" and "think" capabilities that can perform straightforward process automation, as well as apply intelligent algorithms for handling exceptions based on analyzing past transaction data.

  In just weeks, the automated claims system was in place, and the intelligent agents eliminated a backlog of 8,000 claims in just five days, at 99% first-pass accuracy. Today, the solution handles every out-of-network claim for this provider. The always-available automated agents not only determine who should be reimbursed but also complete all necessary documentation to ensure the health plan pays the right party for each and every claim.

Advancing the Journey

The promise of intelligent automation is real, and it's here now. Business leaders should get started on taking the aforementioned steps and begin building plans to understand current and future opportunities and chart a path forward. It's important to keep in mind that while the progression from "do, think, learn" and ultimately "adapt" has evolved over time, the entire continuum will play an important role in new digital delivery, operational and human capital management models, and organizations should be prepared to adjust and evolve their automation ecosystem.

Organizations that get started on the automation journey will soon experience the benefits of process acceleration, greater efficiency, quality gains and optimized work teams, and begin collaborating, creating and improving results like never before.

Footnotes

1 "Software Robots Can Reduce Operating Costs by 90%," PR Newswire, Feb. 9, 2016, http://www.prnewswire.com/news-releases/software-robots-can-reduce-operating-costs-by-90-300217347.html.

2 Klaus Schwab, "The Fourth Industrial Revoluion," World Economic Forum, http://www.weforum.org/pages/the-fourth-industrial-revolution-by-klaus-schwab.

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Acknowledgments

This article would not have been possible without the research and writing contributions of Vivek Asija, a Product Marketing Director within Cognizant's Emerging Business Accelerator. He can be reached at Vivek.Asija@cognizant.com.