

Intelligent Automation: Exploring Enterprise Opportunities for Systems that Do, Think and Learn

To compete in an era of globalization and fast-moving business change, organizations need to apply smart technologies, which can reduce costs, increase scalability, improve accuracy, boost speed and make better use of human efforts.

Executive Summary

Businesses today exist in an era of globalization, hyper-competitiveness and ever-accelerating business cycles. To succeed in this environment, many enterprises are focusing on the top-level objectives of reducing operational complexity, increasing agility and speeding innovation while lowering the associated costs. Of all the various levers organizations can pull to achieve these goals, smart technologies – which we call intelligent automation – are among the most versatile and effective.

Opportunities abound for applying intelligent automation (see Figure 1). In many organizations, multiple processes continue to require manual workarounds, which results in smart people spending their time on limited-value, rote and repetitive manual process steps. These processes can be found in back offices, processing centers and anywhere else that an interface has been built between legacy and digital front-end applications.

Compared with many other approaches – such as wholesale system migrations, new ERP solutions or even many process re-engineering efforts – intelligent automation can be implemented quickly, with limited cost. The value of intelligent automation includes reduced cost, increased scalability, improved accuracy and consistency, faster processing, better use of human efforts, improved compliance and audit trails, and faster ROI.

Exploring the Possibilities of Intelligent Automation

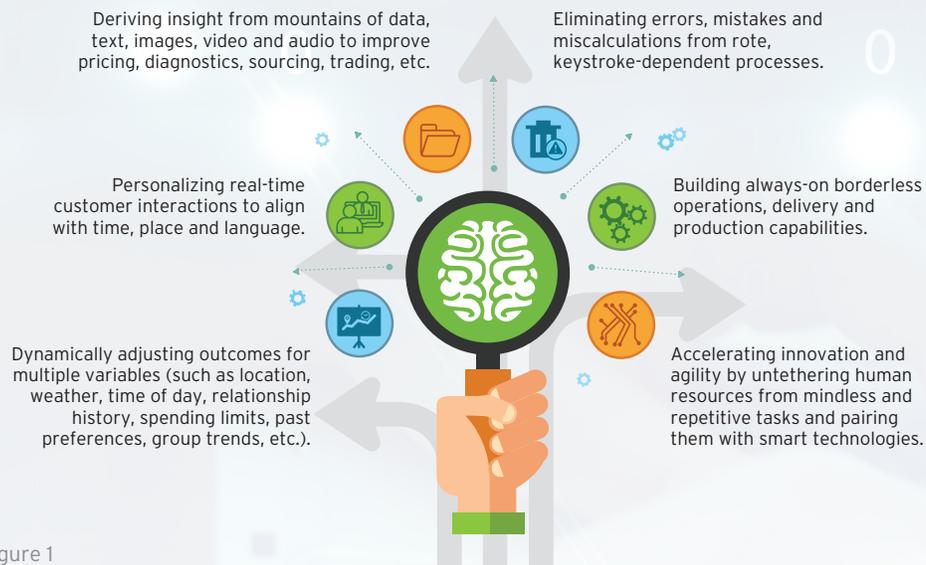


Figure 1



Introducing Systems that Do, Think and Learn

Our point of view on the future of enterprise automation is represented by our “Do-Think-Learn” Intelligent Automation Continuum. Simply put, Do-Think-Learn categorizes automation technologies into three horizons (see Figure 2).

Intelligent Automation Continuum



Figure 2

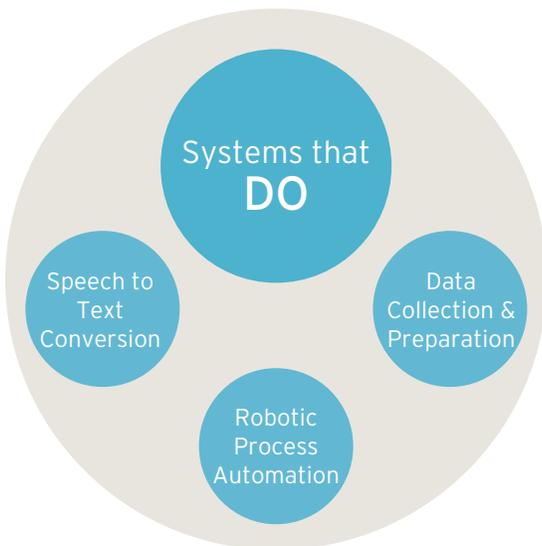


Figure 3

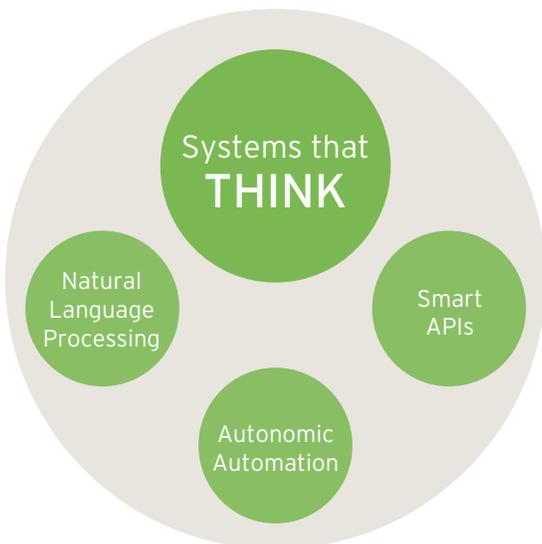


Figure 4

Systems that Do

Organizations today are investing much time and effort in the first part of the automation continuum: systems that “do” (see Figure 3). This type of automation is best represented by robotic process automation (RPA), which is the on-ramp for many just getting started with intelligent automation. 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, object 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.

RPA is far more flexible and secure than macros, scales quickly and is relatively low-cost compared with traditional business process management systems or process re-engineering studies. Business users with very modest developer 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 could take overloaded IT teams multiple quarters to complete – assuming they could even get the project funded and scheduled.

Systems that Think

Whereas today’s 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 (see Figure 4). The big advantage with automation technologies that think is the introduction of logic, which allows these programs to make decisions autonomously, or on their own, when they encounter exceptions or other variances in the processes they execute.

If you look at IT service automation as an example, these systems are able to analyze a user-generated request or trouble ticket for key

words or other triggers; then, based on embedded algorithms and logic, they can then make decisions as to how to best prioritize and address each case. Even better, over time their performance improves as they develop comprehensive histories of resolution data, which they are able to access 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 or other systems that “do,” which operate best in defined, rules-based processes.

Natural language processing (NLP) is another example of an automation technology that thinks. Natural language processing is a fast evolving form of software automation that can interpret spoken or written communication and translate it into executable actions that can be made by the computer 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 characterized by their ability to analyze vast amounts of dynamic and unstructured input, and execute processes that are highly dynamic and non-rules-based (see Figure 5). As an example, machine learning is improving the diagnostic capabilities of medical imaging systems; allowing online retailers to create highly individualized catalogs; and improving the way software companies 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, but when variables change – such as location, resource availability or suspicious activity – they can make adjustments optimized for the new situation. In the enterprise world, imagine these systems that learn running in tandem with your 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 – from financial 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 important to understand in terms of the Intelligent Automation Continuum of today, is that every organization has vast opportunities to apply all the technologies of systems that do, think and learn to improve business processes, accelerate outcomes, increase data quality and enable powerful and predictive analytics (see Figure 6, next page). Yet, even more compelling than this digitization of work that these technologies provide is their ability to improve the human role of organizational operations. People are now more empowered than ever to do what humans do well – which is to think creatively, solve problems, prioritize and interact with clients, partners and coworkers in smarter, more productive ways than ever before possible.

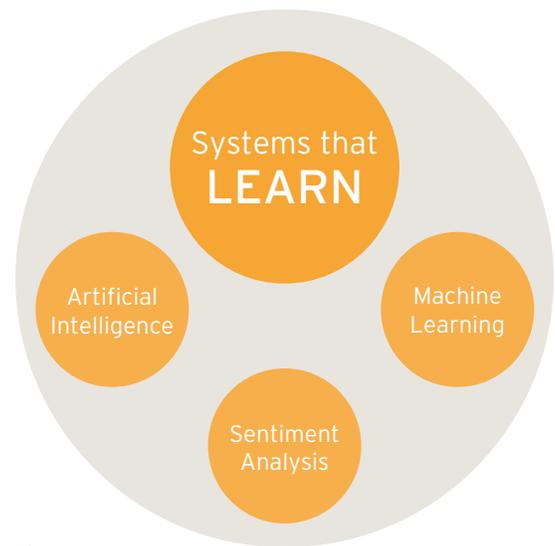


Figure 5

Opportunities across the Continuum



Figure 6

Looking Beyond Do-Think-Learn

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

- **Embedded intelligence becomes table stakes.** Imagine your set top box without a DVR or your smartphone without a voice-activated personal assistant. Expect the same transition 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.
- **Do-Think-Learn becomes Think-Learn-Adapt.** As the technologies that enable intelligence become more pervasive across the ecosystem, the "systems that do" horizon will become narrower and less useful. The "systems that think" category then becomes the entry tier as learning systems become mainstream. By mid-2017, the new horizon three will be "systems that adapt," meaning systems with the self-awareness to not only learn but to also decide autonomously how to apply that learning to provide smarter, more effective outcomes.

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In truth, business leaders today have no choice but to acknowledge that automation in all its forms is already playing a role in their organization's future

(see Figure 7, next page). Taking a wait-and-see stance is not an option when systems that do, think and learn are already fast at work differentiating competitors, as markets and whole industries reposition themselves for the Fourth Industrial Revolution now upon us.¹

Rethinking Industries for Intelligent Automation

Banking and Financial Services	Healthcare and Life Sciences	Retail and Consumer Services
<p>“Given the sheer amount of data generated in the financial industry, both by established banks and disruptive fintech start-ups, automation is becoming a crucial cog in this global machine.</p> <p>“A recent Citi report estimates that bots now manage approximately \$20 billion of assets globally. Going by current trends, this could one day increase to as much as \$13.5 trillion. Additionally, in the increasingly influential area of cryptocurrency and blockchain ledgers, ‘smart contracts’ are continuously written and signed from one AI bot to another, to instantly articulate and verify every financial transaction.”</p> <p><i>Silicon Republic</i>, April 18, 2016</p>	<p>“‘What if a system could draw a connection between this particular patient and to some previous cases dealt with by other physicians at other hospitals or other historic cases in the system. That could be made possible by an artificial intelligence system,’ said Eric Xing, a professor at Carnegie Mellon University.”</p> <p><i>ZDNet</i>, April 27, 2016</p> <p>“‘Machine learning has the potential to become a powerful tool in plastic surgery, allowing surgeons to harness complex clinical data to help guide key clinical decision-making,’ writes Dr. Jonathan Kanevsky of McGill University, Montreal.”</p> <p><i>Wolters Kluwer</i>, April 30, 2016</p>	<p>“As retailers and brands predict and plan for the way consumers will shop in the future, artificial intelligence is high on the business development strategy for 2016 and beyond.</p> <p>“Within retail, intelligent assistance is a rapidly developing area of AI that has the potential to change the consumer experience, as it uses big data combined with natural language interfaces and machine learning to provide human-like interactions. The assistants are quicker than their human counterparts and can analyze vast amounts of data in seconds.”</p> <p><i>IT Pro Portal</i>, March 20, 2016</p>

Figure 7

Moving Forward With Intelligent Automation

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

1. Think Big; Scale Fast

With this approach, organizations identify automation as a top strategic initiative across their entire enterprise. They also 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. 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.

2. A Winning Partnership

No one organization has the corner on all things automation. Businesses will need to turn to a partner to help them quickly take advantage of potentially game-changing intelligent automation technology offered by small, emerging vendors. We worked with a multinational financial services company to deploy an intelligent automation product across large volumes of back-office transactions. We benchmarked the vendor’s technology, validated its capabilities and then supported the

effort of designing, testing and deploying the automation solution into the client's operations.

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 leading-edge automation technologies into their environment.

Business leaders should begin developing plans now to understand the present and future opportunities and begin charting the path forward for their organizations.

3. Automation On-Demand

Some organizations have no intention of becoming automation experts themselves but still want the benefits of these technologies. We worked with a healthcare payer to implement an as-a-service approach to quickly and accurately process out-of-network claims. 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.

Getting Started

As suggested earlier, the promise of intelligent automation is real, and it's here now. Business leaders should begin developing plans now to understand the present and

Cognizant's Rapid Intelligent Automation Framework

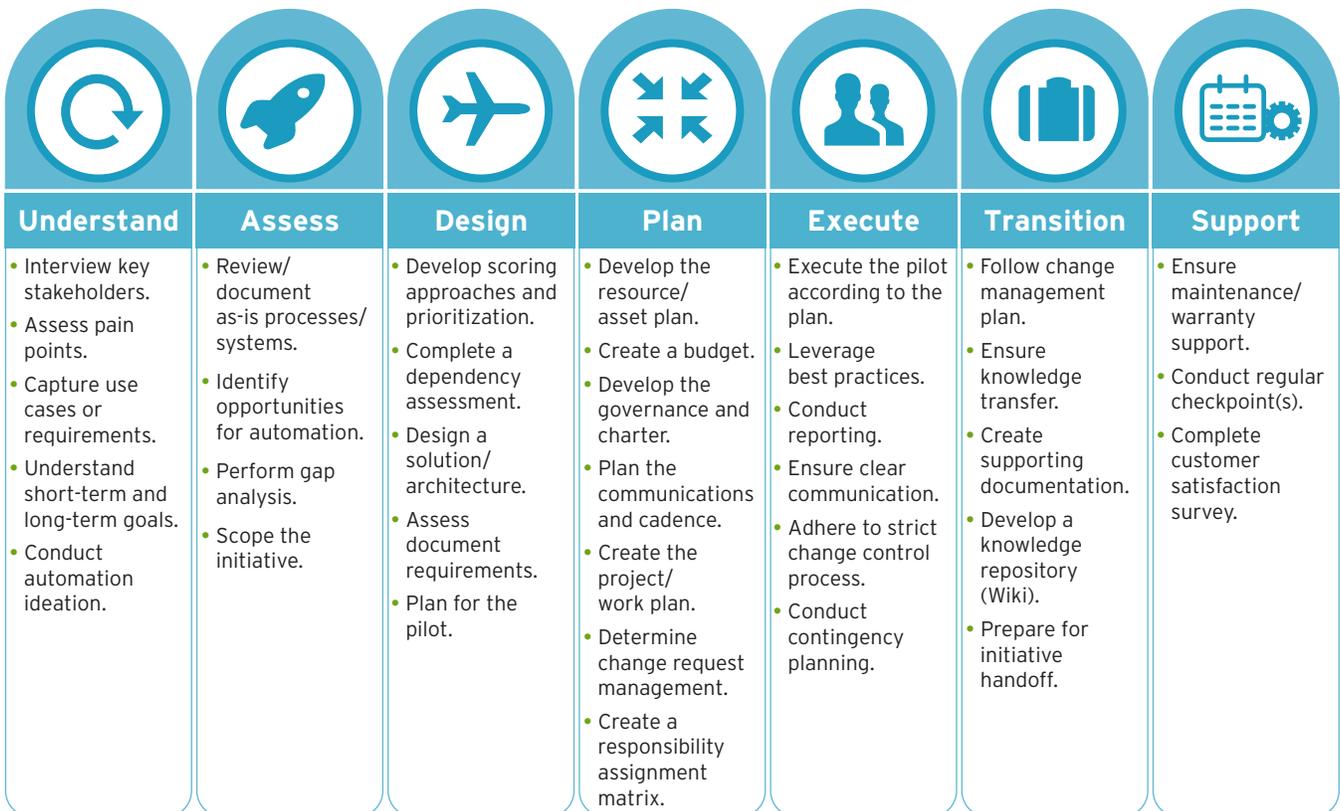


Figure 8

future opportunities and begin charting the path forward for their organizations (see Figure 8, previous page). Keep in mind that the full continuum of “do, think and learn” technologies will have a role in your organization’s new digital delivery and operational models, and be prepared to adjust and evolve as this automation ecosystem is sure to continue doing so as well. Most important, now is the time to start your organization on the automation journey so you too can begin experiencing the benefits of process acceleration, greater efficiency, quality gains and the unleashing of people and work teams from rote rule books to begin collaborating, creating and improving results like never before.

To get started, businesses should abide by the following guidelines:

- **Automate first.** Rather than looking at wholesale system changes, process engineering or complex studies, companies will realize that intelligent automation can be tried, tested and either fail or scale in very short cycles. So why not automate first and start capturing the benefits right away? In parallel, you can take the time to consider the costlier and more complex approaches to create efficiency.
- **Automate ambitiously.** Intelligent automation will span many technology approaches and address all sorts of process challenges, from high-volume to low, complex to simple, structured data 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 with 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. That awareness and insight will form the goals by which implementation success will be benchmarked. The incremental successes delivered today by rudimentary levels of intelligent automation – systems that do – won’t be enough anymore.

To read more about intelligent automation and other advanced technologies, such as IoT, cloud, mobility and security, see our Digitally Cognizant blog <http://digitally.cognizant.com/digital-technologies/automation/>.

Footnotes

- ¹ <http://www.weforum.org/pages/the-fourth-industrial-revolution-by-klaus-schwab>.

About the Author

Matthew Smith leads the Automation Venture for Cognizant’s Emerging Business Accelerator organization. His responsibilities include automation strategy, enablement and market communications. In this role, Matt works closely with Cognizant internal automation and related technology practices, client-facing teams and leading external providers of automation, AI and other cognitive technologies. Matt has a bachelor’s in business administration from Stetson University. He can be reached at matt.smith@cognizant.com. | Twitter: https://twitter.com/_MatthewJSmith | LinkedIn: <https://www.linkedin.com/in/matthewjsmith01/> | Flipboard: [Automation, AI and the Digital Enterprise](http://www.matthew-j-smith.com/category/robotic-process-automation/) | Blog: <http://www.matthew-j-smith.com/category/robotic-process-automation/>.



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