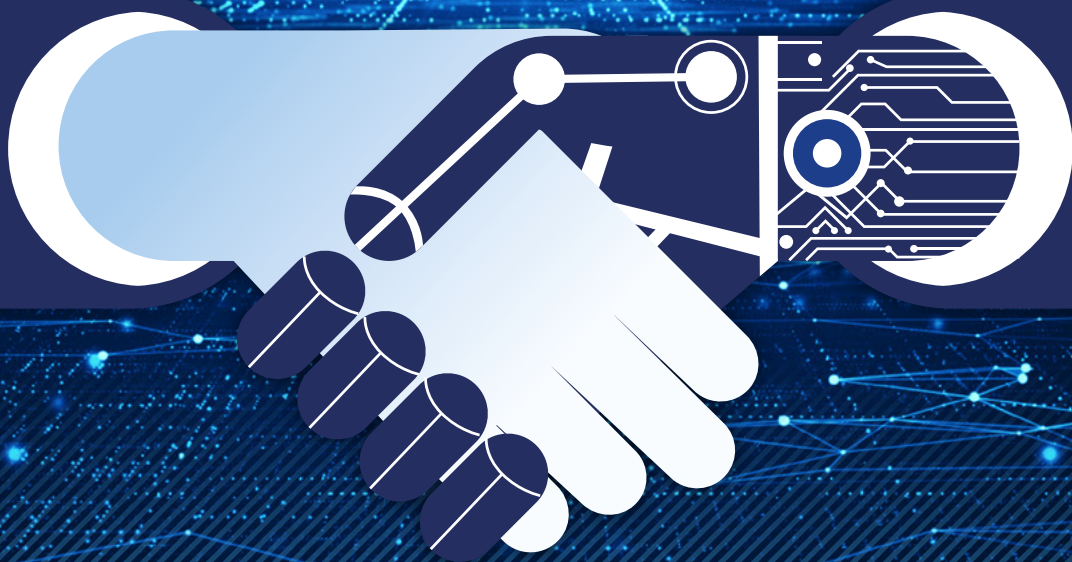


THE TOP IA TECHNOLOGIES DRIVING BUSINESS RESILIENCY & DIGITAL EXCELLENCE IN SHARED SERVICES



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Introduction

Enterprise of every size, in every conceivable industry and in every corner of the globe has been tested in the last 18 months and will continue to be tested for the foreseeable future. Predictable patterns of commerce have been turned upside down. Buying patterns have massively shifted for both consumer and business wreaking havoc in supply chains that were already operating near capacity. This on top of globalization, disruptive technology, digital native startups, and cost pressure. But as it has been for all of history: in times of change, there is opportunity. These seismic changes are creating gaps that provide fertile ground for disrupters (companies and technology) to take root and grow quickly. Added to the already packed board agenda is workforce. The cost, availability, and productivity of a companies' most valuable resource – people – is in flux. The pandemic has changed peoples' behavior as consumers and as employees of global business. The nearly instantaneous transformation of office space, business travel and regular face-to-face engagement is having an unpredictable impact to business in the near and medium term. Large enterprise today is fighting a three-front war.

Any military strategist will tell you, avoid fighting a war on two fronts and avoid three at all costs. The reality is that all three of these major influences (digital native disrupters, buying patterns/behavior, and workforce) exert influence on similar systems inside an enterprise. How can enterprises drive demand while nurturing talent to deliver superior products and experiences? This is the challenge in front of business today. In practical terms, it implies a successful enterprise must create and deliver top quality employee experience, redesign delivery and supply chain, and stay at least on par with the digital disruption in their particular industry.

One of the primary weapons businesses are bringing to bear is automation. Automation is kind of a big word with smudgy boundaries and applies (with equivalent impact) to all functions of a business. For our purposes, it means the automation of digital work and the digitization of data that can now be acted upon by the base of automation technology. The agnostic, non-marketing, term for this is Intelligent Automation (IA). Marketers and analysts like to use glitzier terms for this mega-trend like hyper automation, but it all stills boil down to these two things: digitize more work and automate digital work in a virtuous loop. Digital Transformation (DTx) is somewhat distinct in that it adds the creation of new products, experiences or capabilities as well. It is helpful to think of Dtx as the adoption of the new and the optimization of the existing. More on that later.

Shared services and outsourcing is the industry focused on the optimization of existing operations of large companies with new tools, techniques, and technology. The newest of which is Intelligent Automation (IA). IA greatly expands the arsenal of capabilities that can be applied to improving the efficiency and effectiveness of business operations. As an industry organizer, analyst, and catalyst; SSON has been watching with interest as smart people and companies find new and better ways to drive ever greater efficiency and effectiveness into operations. Certainly the big deal the last six or seven years has been automation. While some may argue there are more, there are at least five major trends moving us forward and without question, the pace of play continues to accelerate. Read on to learn more about the big ideas, recent history, company and customer perspectives and a bit about the future in the transformative power of intelligent automation.

Five IA Trends Shaping Shared Services Today

The use of automation is a broad topic. Here, the focus will generally be on technology trends rather than the operational and process related fields also essential to automation. Even with a focus on technology changes and trends, there is a lot happening, but below are five categories that capture the big shifts in the market today. These are presented in no particular order as each can stand alone. A reasonable argument can be made that any one of these is the most significant trend in IA.

Jump to...



Intelligence
Document Processing (IDP)



Artificial
Intelligence (AI/ML)



Robotic
Process Automation (RPA)



Business Process Automation
(BPA)



Natural Language Processing,
Generation and Understanding
(NLP/G/U)

Let's take a closer look...



Intelligent Document Processing (IDP)

Overcoming the challenges of documents in the enterprise is one of the primary "next horizons" of automation. The magnitude of the challenge and the improvements in technology make it a ripe target for mastery. However, this is not a simple solve. It does often require working with specialists in the IDP field that come armed with the knowledge, and technology to tackle automated handling of documents. Increasingly capable tools are available, and a growing body of IDP knowledge is available now to make significant progress in document processing.

There are five things worth noting in IDP:

- **The Challenge: Still a Lot of Paper**
- **The Opportunity: Recognition and Understanding**
- **The Opportunity: Adaptive Path Orchestration**
- **The Opportunity: Integration (automation platforms)**
- **What Does the Market Think?**

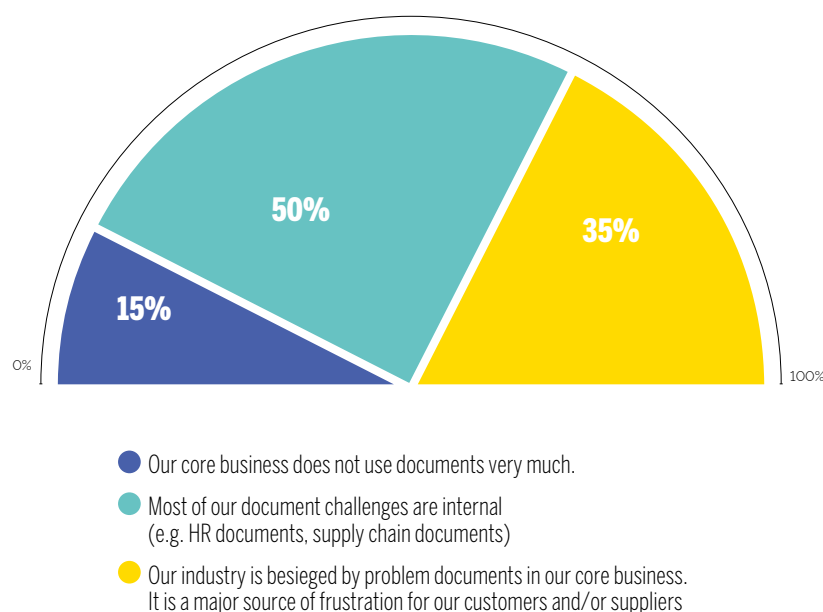
The Challenge: Still a Lot of Paper

IDP has risen to a “must have” capability to any sort of holistic business process transformation. As much as we would like to believe that we have reduced the paper in modern business, we have not. When you think about it as a communication service, it is the communication of last resort. When we have no electronic way of communicating as a consumer or business, the most time-tested reliable communication is the mail. Half of businesses surveyed struggle with documents in their core business in addition to the 35% who struggle with internal documents.

The tide does appear to be turning, and mail reached a peak annual volume in 2012. Mail overall peaked at 173 billion and recent figures place it at 143 billion pieces of mail per year. Most of the reduction is consumer mail. The volume of business mail is not dropping as quickly as all would wish.

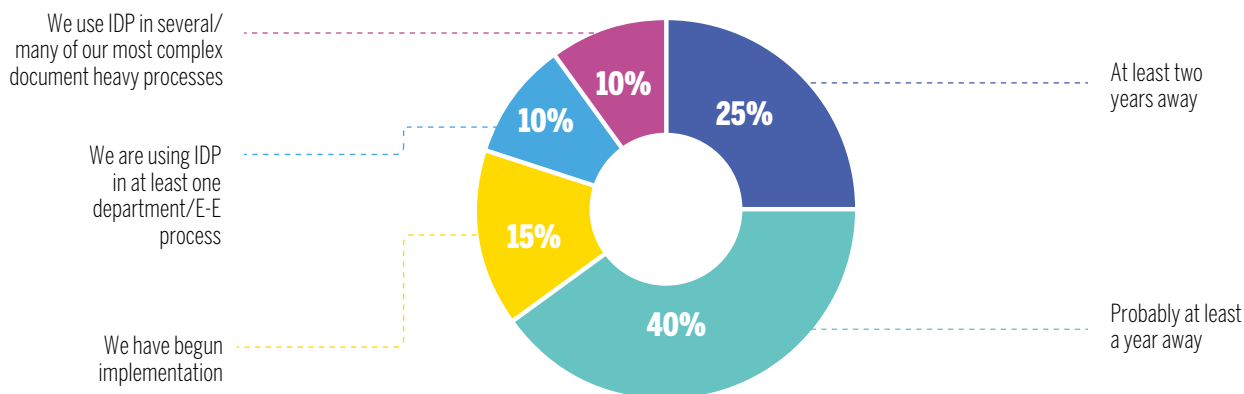
There is an important difference between a paper document and an electronic one, but this has largely been solved. You may be surprised to learn that the first patent for Optical Character Recognition (OCR) was in 1920, for Gustav Tauschek's “Reading Machine”. This is how long we have collectively been trying to solve for the automation of document processing. With more than 100 years of work improving OCR, there are many extraction engines to choose from and they are consumable as a web service at a very low cost. While OCR is not the leading edge of automation any longer, the important trend to note is that it has arrived, it is production ready and can generally be relied upon to do its job. Fully 65% of companies surveyed have IDP on their strategic roadmap in the next two years.

What kinds of documents does your industry/business vertical deal with?



Source: SSON's Intelligent Automation Market Report Survey (Q4 2021)

Where is Intelligent Document Processing (IDP) on your roadmap?



Source: SSON's Intelligent Automation Market Report Survey (Q4 2021)

That is not to say there is not more to do. For example, combining Optical Image Recognition (OIR) with OCR can improve outcomes. Today's technology can extract an address and recognize the logo on the page at the same time. The data for the address and other fields can be correlated from publicly available data sources making it a useful tool on the transformation work bench. Handwriting is another OCR technology that is making solid progress. While current systems are not capable of usable production level performance today, it is only a matter of time.

One of the more complex problems still faced in this field is where a computer generated form has been written on by a person. It is important to recognize this scenario, and extract both elements. This can be done by extracting the handwriting first, separating it for analysis/conversion, then removing it from the image, and using sophisticated algorithms to replace the voids now present in the rest of the document where the pen strokes were removed. It is an area to watch. The question is whether handwriting will largely die in business communications first or technology will master it first. Most likely is a combination of the two.

All of these advances provide better fuel for IDP. IDP can consume not just the text fields, but images and other elements present on the image. Whether or not handwriting is successfully extracted, the fact that handwriting is present is useful as a determinant in the accurately routing a document for processing. With a typical enterprise dealing with 200+ different kinds of documents every day, it remains essential that every correspondence get formally received as well. The date that gets put next to that little red receiving stamp (or its electronic equivalent) is a defined term in almost every contract when stating payment terms. Legal and financial risk can be reduced with IDP serving the "front door" of the enterprise. It considerably reduces the volume of manual processing, while at the same time improving accuracy and control.

The Opportunity: Recognition and Understanding

While OCR is focused on reliably extracting data from an image, what comes out is still unstructured data. Enter the modern IDP systems. In order to be useful in an automation sense, every communication (whether electronic or other) must be understood. Specifically, IDP includes capabilities intended to discover both the "payload" and the "purpose" of the communication. The two are tightly correlated. A system that recognizes elements of an invoice from an image yet fails to recognize that the intent of the sender was to notify you that a previous billing was incorrect will send that piece of work down the wrong path. The purpose of any communication can generally be inferred or predicted by inspection of the information in the communication as well as the "origination context".

Two general approaches to recognition and understanding are employed today and they are often used together. The first is an initial interrogation of the document. This first look will search for everything on the document. Based on what is there and what is not there, ML models can predict a set of likely purposes for the document. Analysis is performed to assess possible purposes and see if the document satisfies the requirements for that purpose. This result could reveal more than one possible purpose. As in the above example, finding the words "correction notice" might indicate that the purpose of the communication is to update an invoice. It also might mean the address has changed.

With a narrowed set of possible purposes, the document can be interrogated a second time to look for additional clues. If the second examination also finds the words "new address" or "new remit to" and correlates that to be physically close to a new address that is not in the current billing master data, it is highly probable that the purpose of this correspondence is to update the billing address and resend invoices to the new address.

The second approach is made possible by the IDP platform. The IDP platform can be integrated to any number of other data sources. Having access to every recent correspondence or activity with a given entity can shed light on purpose. Continuing with the current example, if the IDP platform has access to the check register, cash ledger and ageing information; the IDP platform can determine that multiple checks have been issued to that vendor, the checks have not been cashed, and all of their payables are aging. This is critical information for business resilience. If payments are not received, a credit hold could occur causing supply chain disruption and incurring penalties and interest.

IDP platforms bring together the core of smart text extraction, along with some AI capabilities in the form of predictive ML models that can evaluate all different kinds of information to arrive at a correct prediction of the purpose. Once the purpose is known, then the payload (the details related to the purpose) can also be evaluated for completeness. In this way, IDP is a platform bringing together multiple sources of data in addition to the transaction data. Combinations of this data can be processed by advanced ML models to produce a complete "origination context" and content sufficient for automation processing.



The Opportunity: Adaptive Path Orchestration

Now that purpose, payload and origination context are understood, advanced IDP platforms can now work with existing workflow systems and even provide additional workflow capability to route a transaction in a manner specific to that transaction. Staying with our example, perhaps a company policy requires any address change related to a payment to be reviewed by a person for audit and control purposes. IDP platforms today have the ability quickly build and deploy workflow including adding Human in the Loop (HITL) information exchange. IDP can pause a transaction, initiate a human review (which itself may have several steps), and after receiving the needed input, continue moving that transaction down the right path.

It is not unusual for an enterprise to have 25 or more process flows for how documents are processed. Some of these exception paths may accumulate additional data along the way. With our example, perhaps a person was recruited to verify the new address, and the invoice moves to the next step. Perhaps the payment method was also changed from an ACH transfer to a paper check. This will set off a red flag in the audit arena. It is suspect that someone would change the address and payment method; particularly to a less efficient method of payment. IDP can detect these factors and present all historical information to a person to initiate a payment method change. Because of fraud risk, this process is tightly controlled.

The trend is increasingly capable adaptive work orchestration. As the systems gets "smarter" through the processing, this data is accumulated into the master record of the transaction and serves to further determine the next best action required to successfully process the transaction.

The Opportunity: Integration and BPA

The big trend with IDP providers is the ability to integrate. All of these advanced capabilities require integration with other systems. Modern IDP solutions offer a host of prebuilt integration capabilities to connect to commonly used systems. When it comes to IDP and documents, a typical enterprise will have many workflow systems in place: one for finance related stuff, one for people/HR related stuff, another for customer issues, etc... IDP offers easy access to prebuilt connectors for common enterprise systems, a full suite of APIs, and the ability to characterize customer interfaces that are needed for older legacy systems that do not have modern interface capability.

It is worth noting that IDP implementation, along with the attendant integrations, are significantly more complex than RPA. This requires a true business – IT partnership to succeed. For many good reasons, IT and audit have many controls in place to ensure the integrity of other systems and processes. IDP implementation is typically a multi-year endeavor with a carefully constructed plan to release the core capabilities, and then release increasing complex components over time. IDP is a major intelligent automation advancement that has the potential to deliver both efficiency and effectiveness benefits.

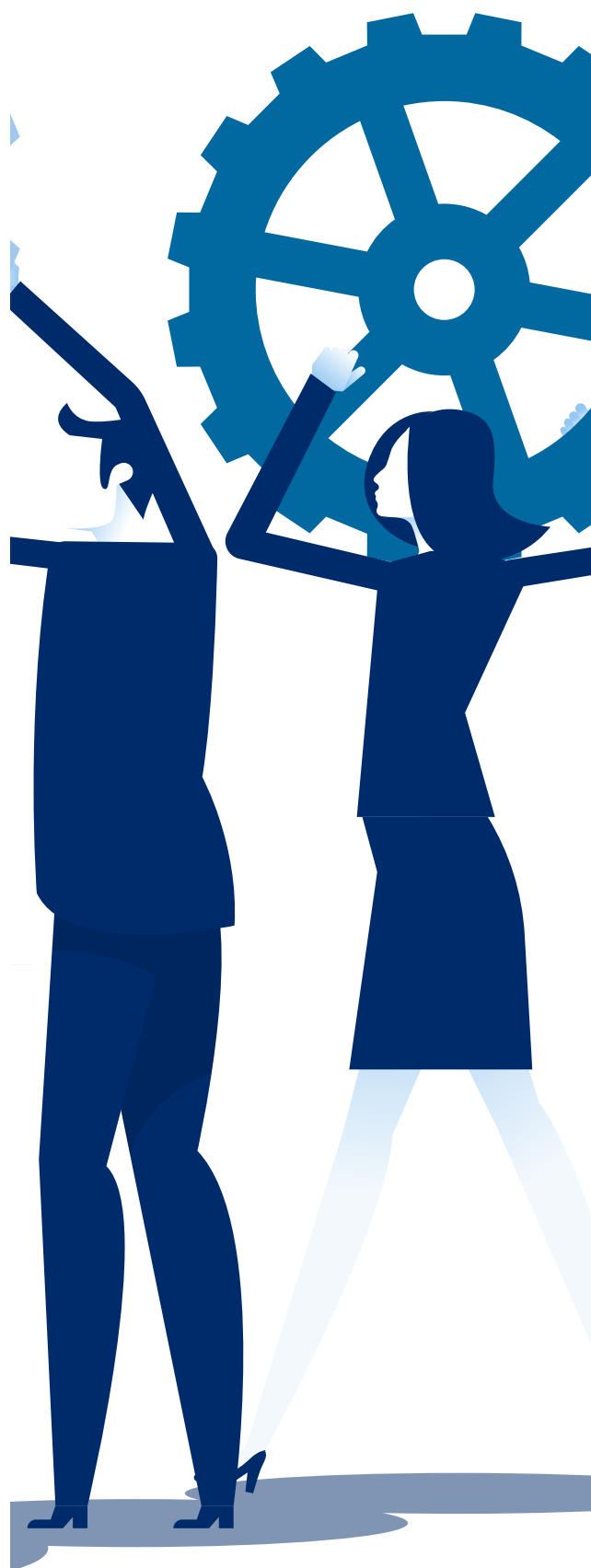
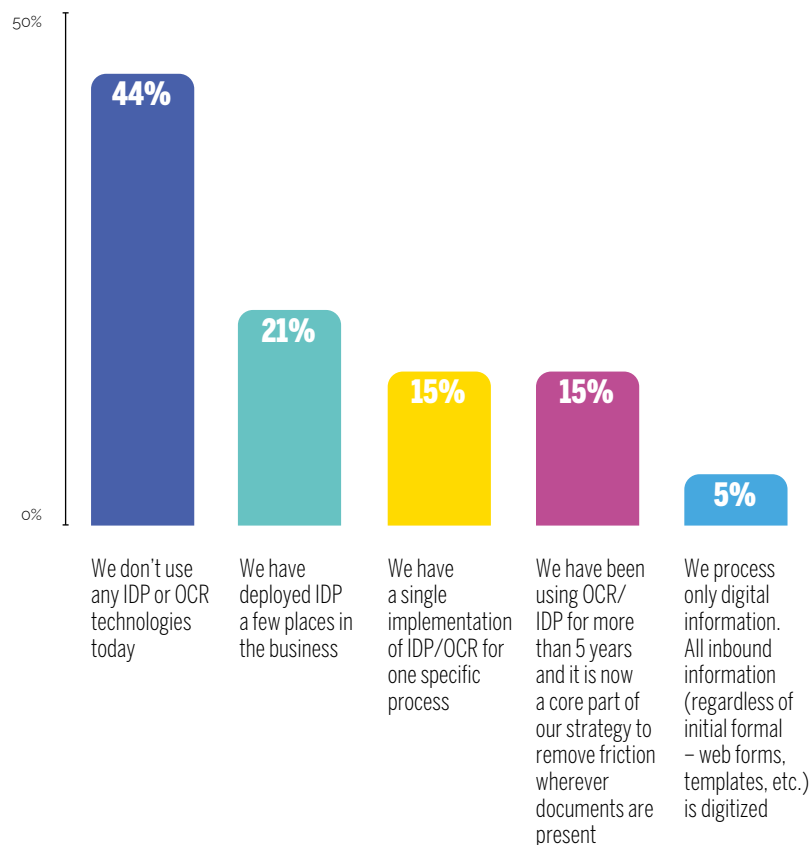
This level of integration capability has many of the ingredients present in BPA platforms. It is not uncommon for IDP to serve as the core in a BPA platform. Document extraction, workflow, in-line ML models, and high levels of integration are all key elements at the heart of BPMS and BPA platforms as well. Much can be accomplished with top IDP technology. While generally not capable of full End-to-End (E-E) process transformation, IDP can successfully conquer high complexity work and relieve people from the digital drudgery of manually managing documents.

What Does the Market Think?

For the foreseeable future, documents are a part of business reality. Progress will continue on reducing paper, but the most common replacement for that is an email or a webform. They both carry loads of unstructured data. IDP brings key capabilities together to recognize the transaction, and divine the purpose and payload. Understanding the purpose and having the accurate validated payload, IDP systems go to work adapting workflow, and get smarter along the way. Adding robust integration options and IDP can serve as the core to BPA level capability. More than 40% of businesses today have not yet begun their IDP journey. This, coupled with the fact that 65% of businesses are looking for IDP in the next two years implies that IDP really is the next major wave of automation.

IDP can be used for increasingly complex process areas that have historically been the purview of people. These often manifest as either industry specific IDP solutions such as loan processing or claims adjudication or "horizontal" solutions such as accounts payable or customer billing. IDP has arrived and is an essential part of your transformation agenda.

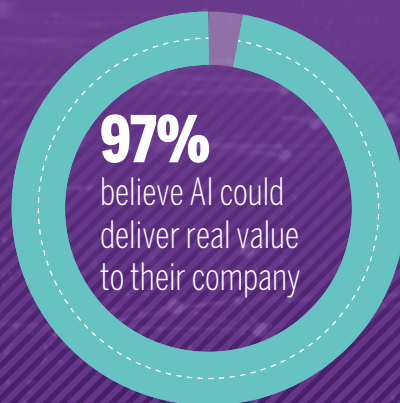
What best describes your experience with IDP





Artificial Intelligence (AI/ML)

Artificial Intelligence (AI) is such a nebulous term that it has almost become meaningless. Perhaps a regulation is needed similar to the FDA food content guidelines so it can become clearer what is in the package. However, it is clear that almost everyone surveyed in SSON's Intelligent Automation Market Report (Q4 2021) believes AI will make a significant impact on their business.



This section will Cover 4 areas for AI:

- Defining AI
- The Opportunity: Placing the "Intelligence" in Intelligent Automation
- The Opportunity: Predicting the Future
- The Reality: ML in Practice

Defining AI

It is being applied to almost any technology and it is even hard for so-called experts in the field to draw a hard line. In fact, it can and has been argued that even the term is inherently wrong. There is no question that the field of AI would definitely benefit from some finer-grained terms and some sort of agreement around the use of terminology. When we say intelligence (artificial or not), what is really being said? For the last 40 or 50 years, most of the world has agreed that there are seven types of intelligence at least as it pertains to human intelligence potentials. Of the seven, some have limited use today such as kinesthetic intelligence or intrapersonal. Others have application today such as logic/math and perhaps spatial. Force fitting machine intelligence or Silicon Based intelligence (SBI) into this seven part framework has some limited practical uses, but there is a separate structure for AI:

- Reactive machines
- Limited memory machines
- Theory of mind machines
- Self-aware machines

This is a partially useful framework when talking about AI in automation. At least the first two examples of reactive and limited memory. A reactive machine is capable of responding to stimuli in a way consistent with an intention. The devices we currently call self-driving (now thankfully categorized from Level 1 to Level 5) cars are in large part reactive machines. They have been built with a set of prioritized intentions and can react to complex inputs in a manner consistent with those intentions. Our own spinal cord demonstrates this level of intelligence. While the spinal cord is not typically thought of as "intelligent", it is if using the definition of reactive machines. Several reflexes are handled in the spine. The reaction you have when you step on a Lego... that occurs in the spine. You may notice that you step off it faster than if you had to think about it. It is even sometimes called the Lego Reflex, but its proper name is the Withdrawal Reflex.



Whenever talking about intelligence (regardless of its origin), it is useful to put some boundaries around what kind of intelligence, and what level of intelligence. In the world of IA, intelligence is applied to do a few specific things. In this case, to respond correctly to complex inputs to route work in the right way or send work to a place where it can get further processed outside of the technology. The idea of the happy path is useful here. When a transaction is detected to be compliant with the conditions of the happy path, then the work is sent to follow that path. With intelligence applied, a predictive analytic can be returned that will usefully predict what path a transaction needs to follow. Increasingly smart technologies are being applied that expand the breadth of the conditions that it can accurately predict. If a process has 25 exception paths (this is not unusual), you can appreciate the complexity of the inputs and conditions needed to send that work along correctly. These use-cases are now within current capability.

That brings us to limited memory machines. A limited memory machine uses memory of the past to improve responses in the future. We could call this learning. This is the basis for the term Machine Learning

(ML). Machine learning models are designed to respond to inputs and be able to improve performance by "ingesting" performance data about its own performance and sometimes specific training data. A signal for rightness is provided. How close was the ML system to "getting it right"? This is the master outcome against which the mathematics in the ML model correlate. There are many things that get fed back into a model, but one of the most important is the degree of correctness in the response. Said simply, the model can take "this was right and that was wrong" and use that information to improve the weighting it gives to these same inputs in a later transaction. In this way, it learns. It is worth noting here, that part of the magic of ML is knowing what factors to feed back into the model. Further, should anything change with the original inputs? Are they the right ones? Do they really have not just a correlation relationship, but a causation relationship?

Using the word magic here is not for dramatic license. Leaders in this field will tell you stories of things that happen in the lab that are magical. A few years ago, a professor declared that, currently, ML is about 30% science and 70% experience and intuition often born from

experimentation. It is counter intuitive to imagine that reducing inputs that are known to be causally linked would improve the performance of the ML model, but it happens. Perhaps it is a kind of machine ADD. When presented with nine inputs, confusion results, but take the right 5, and perhaps a savant is created. One might also hear tales coming from the halls where neural networks (different from ML, but often with the same kinds of purposes) are studied. Entire academic departments admit they are unable to reproduce a successful model of their own or another's, despite the most detailed data and instructions for training the model.

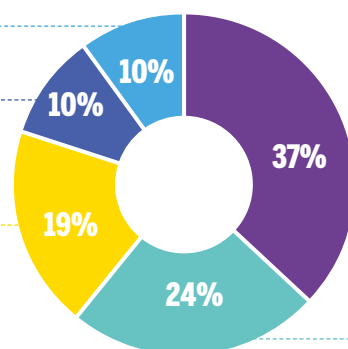
What does this have to do with AI in automation? Understanding the limited scale and scope of what is needed is useful when it comes to being practical in terms of what we are looking for this kind of intelligence *to do*. What is the job-to-be-done? The AI space is not an easy one to master. While everyone is confident AI will make a difference in their business, 37% remain on the sidelines, and only 10% report using AI in their core business today.

Where have you deployed AI?

Our AI program is central to our core strategy and is a board/investor matter that receives the highest level of attention. We rely on AI systems for our core business

We have an operational AI team, a full "AI stack" of hardware/software, and have a pipeline of production AI projects

We use some probabilistic analytics in our Business Intelligence function



We remain on the sidelines of real "AI" to see what use-cases or real value/ROI is being generated by others with advanced AI

We have begun our AI journey and have made investments (data science, data stack, infrastructure, etc) in preparation for our AI program to be deployed

Source: SSON's Intelligent Automation Market Report Survey (Q4 2021)

The Opportunity: Placing the “Intelligence” in Intelligent Automation

A common job-to-be-done for intelligence in the field of intelligent automation is the accurate and complete routing of work. This is the work of the orchestrator at the heart of automation. Historically, we rely on business rules to guide a piece of work through a complex process. The input transactions commonly arrive all together with little to no context. Context must be built, discovered or tested along the way. Continuing with the theme of documents, consider the case of an input as a piece of mail. Considerable effort is spent discovering the *origination context* of the input. This context is crucial to routing that piece of mail. Mail from a single vendor could be many things. It could be a holiday card, an invoice, credit slip, collection notice, late notice, out-of-stock, or could even be mislabeled and sent by mistake. In most operations, the automation really begins after the document is extracted, and its purpose and content are known. It is people that try to determine who sent that piece of mail and what kind of result they were looking for. It is also people that do their best to determine if the transaction is something called a “fully formed request”. A request or transaction is fully formed when it contains all necessary information to be able to complete the processing of it. Taking the example of the vendor mail one step further, there is critical information that must accompany the transaction or it will have to stop along the way and receive additional special handling. Perhaps this particular invoice is from a vendor who is in breach of contract and there is legal action. Perhaps it is from a vendor who currently has a credit hold in place against future shipments. These kinds of things change the processing route altogether and change what needs to happen to it along the way. Or take the case of very common situation, the invoice is incomplete.

This seems like a fairly simple problem. Remember that an enterprise has to take action on received mail. There is a legal obligation to do so. But anything that is missing from the request must be completed somehow. And the accuracy of other fields must be validated (e.g., is the invoice at the contracted price). The way we have handled this historically is to build business rules and exception paths that are largely managed by hand. This approach is very much a brute-force method. The invoice is sorted, assigned, and an operator assesses the invoice to make a

judgement about what's missing, and if it is both accurate and correct (not the same thing). The world of business rules is entirely within the deterministic or historical world. That is the world we drive through by steering while looking through the rear-view mirror. Amazing but true, most of the data used to run a business is historical. A person is trained to determine that if the quantity is wrong or the unit of measure is wrong, that it is quite likely the unit price is wrong and the invoice total is wrong. Regardless of whether it is true or not. That is the limitation we currently face. This invoice will be processed to validate, discover or correct things that are not necessary. This reality is why automation use-cases often terminate on either side of the document and why exception processing is still manual in most businesses.

There is a different way. If we apply intelligence to this problem (reactive machines or limited memory machines), we can use ML models trained on millions of invoices if necessary. All of the data about that transaction is fed through a model that has ingested examples of every conceivable (or at least experienced in the real world) type of condition. The model is also fed other data coming from multiple different places that is all relevant to the origination context (like credit hold information in the example). The algorithm finds the features of that piece of mail and can make a usefully accurate prediction about who sent it and what they want. This is the shift into probabilistic analytics.

Through analysis of how work has been handled in the past and what actions or data have been used to create a fully formed request, sources of data can be selected that have some sort of causal relationship to the sender or purpose. This is where the mathematics of ML go to work finding the features that match a set of conditions that result in a prediction.

In the structure of analytics (below), Discovery and Descriptive analytics are by far the most common. These two deterministic analytics drive 99% of future decision making.

The Opportunity: Predicting the Future

Think for a moment. When was the last time you saw a business report that predicted anything? Business is at the very early stages of learning to use predictive analytics for business decisions. However for the purposes of intelligent automation, we can make the move to the third analytic (Predictive) of the five types of analytics. The line between these two worlds cannot be understated. Making the transition to probabilistic analytics is equivalent to passing the event horizon around a black hole. On one side of the black hole, the physics are well understood. On the other side, we can conclude that there are physics, but it is a slow process to measure and define them.

While silicon based intelligence at the prescriptive (akin to Level 3 of self-driving cars) and deductive (AlphaGO) level does exist in our world today, it does not have the clear utility of predictive analytics and is far more complicated. IA does not need a prefrontal cortex. It just needs a few extra neurons in the spinal cord.

The theme of this trend is that it requires clarity about what kind of machine intelligence we need, and what job it is to do. There are many expensive ML experiments out there that have been doomed by failing to establish hard lines around reach and purpose. Key is to be very clear about fit and purpose. It is now established that when considering AI in IA is:

- A reactive machine or limited learning machine (that improves as it operates)
- To produce a useful predictive analytic

In the theme of the example, an ML model that can predict what is needed to create *and* successfully process the now fully formed request for a piece of mail. Using information from the invoice itself and other data sources, an accurate prediction can be made about what steps in what order should be taken to finish forming the request and process it.

The last crucial question here is how well does it need to perform to be useful? For our purposes, there are two important things to know about the performance of a model. While there are many performance criteria useful to the engineers and data teams that develop the models, the user generally cares mostly about accuracy and error rate. An immediate reaction might to that statement might be simply to say that error rate is just the inverse of accuracy, but in ML the two things are distinct features.



Think about it as answering this question:



Discovery

What happened?



Descriptive

How did it happen?



Predictive

What will happen?



Prescriptive

What should be done about it?



Deductive

What would happen "if"?



Q+A with

Yarrow Diamond,

SVP/Innovation & Technology Solutions, **CNB**

Q: As mentioned, Artificial Intelligence is a nebulous term. How would you define it?

A: It's easy to get caught up in AI's far-reaching potential and defining the grand scale. Today at least, it's really just a technology that simulates human behavior based on the data it has access to. In other words, AI systems can perform analyses, reviews, or other data-driven activities similarly to how humans think. Note that AI simulates human cognition such as perception, learning, and problem-solving, rather than exactly replicating it...at least not yet.

Q: How is AI and ML being utilized at CNB?

A: CNB only recently started its AI journey. This year, we focused on foundational tech, upskilled resourcing, and infrastructure changes in preparation for next-level advancement. From here, our initial focus will be on the applied AI front - - i.e. NLP and ML-enhanced RPA leveraging supervised learning algorithms.

Q: What is one thing you would like any practitioner considering purchasing an AI tool to know?

A: I'd recommend getting to know the concepts of AI and the tech that it consists of (ML, NLP, Computer vision, etc.). First and foremost, though, begin with the problem(s) to be solved. Identify the business goals, then the analytical goals that a computer-based solution could help with, and only then move on to identify the tech for procurement.

Q: Where do you see it being utilized in the next 5 years?

If I've learned anything over the years is that innovations often show up in the most unexpected places so we could see all kinds of advances cropping up. One area that comes to mind would be the increased use in the Global Supply-Chain. I believe that AI capabilities such as computer vision and demand sensors could help ensure that industries more proactively respond to potential supply-chain breakdowns. Another fascinating area is prosthetics. We seem to be very close to cyborg-like advances in connecting the brain directly to artificial limbs augmented with AI for more realistic mobility and natural feeling responsiveness.

The Reality: ML in Practice

Accuracy is a measure of how often the model makes a successful prediction. This is a bit more complicated than the simple notion of accuracy that we have all become accustomed to with our two deterministic analytics of discovery and descriptive. A useful illustration of this is from Google's crash course on machine learning based on Aesop's fable of the boy who cried wolf. If we created an ML model to predict if the boy were truly warning the villagers about a wolf, there are really four outcomes.

True Positive

- Reality: A wolf threatened
- Shepherd said: "Wolf"
- Outcome: Shepherd is a hero



False Positive

- Reality: No wolf threatened
- Shepherd said: "Wolf"
- Outcome: Villagers were angry at shepherd for waking them



False Negative

- Reality: A wolf threatened
- Shepherd said: "No Wolf"
- Outcome: The wolf ate all the sheep



True Negative

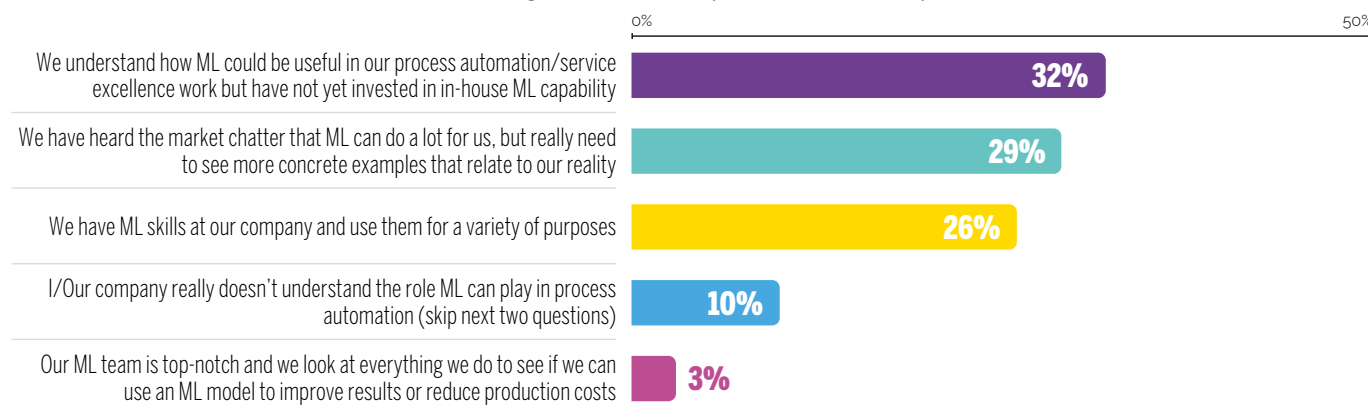
- Reality: No wolf threatened
- Shepherd said: "Wolf"
- Outcome: Everyone is fine



When talking about ML models, a term we are familiar with, accuracy, carries a nuance. It is the measure of how accurately it produced the right prediction on the new (production) data inputs divided the model's accuracy against the training data set. The intent here is not to actually give a crash course in ML, but to highlight some concepts important when setting out to add intelligence to your automation. The takeaway is understand that things like accuracy and error rate have a different

meaning when you are talking about probabilistic models and to fully evaluate the consequences of false positives and false negatives when putting ML to work in your operation. In some cases, the threshold for false positives and false negatives is zero. Only about 30% of companies surveyed have made the investments to make ML useful. This is about the same percentage as those stating they need to see more concrete examples that apply to their industry.

I understand what Machine Learning can do for simple decisions and process/work orchestration...



Source: SSON's Intelligent Automation Market Report Survey (Q4 2021)

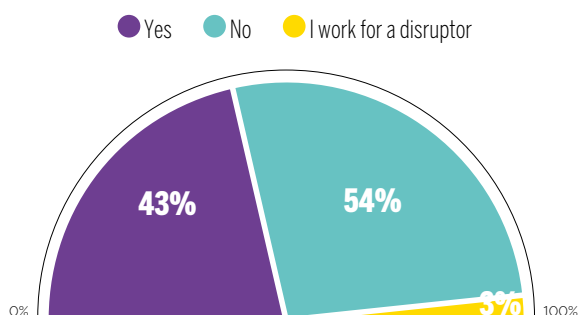
Continuing with the invoice examples, if analysis shows that the consequence of a false positive is that an invoice ends up getting unnecessary extra processing, that may be acceptable. However, if a false negative resulted in payment being made in error (which is almost impossible to recover), then this is an unacceptably serious consequence. In this case, a model that performed with only a 50% positive rate but 0 negative rate, then half of the work will have followed the right path in an automated fashion and no bad payments will leave the building. The decision could be made to put that algorithm into production because it helps without hurting. Teams would continue to refine the model to improve the positive rate without jeopardizing the safety of zero "false negs". When evaluating putting intelligence in to an automation, practicality must be a primary consideration.

Other things are converging to make predictive analytics more available for practical use in automation:

1. Cloud computing and storage
2. Data management tools
3. Design/build tools
4. Access to data

The first three might be expected as a part of the general massive advancement of technology. The last is just as important but more diffuse and uncertain across the enterprise. Because data is now being thought about and considered from the very beginning of process design, the capabilities to exchange data between applications is more prevalent than ever before. This "data-as-value" process is one key differentiator that separates legacy business from digital native disruptors. Disruptors often take a very different approach to how business is performed and more than 40% of companies surveyed

Are there disruptors (digital native companies) that are a clear and present danger to your business?



Source: SSON's Intelligent Automation Market Report Survey (Q4 2021)

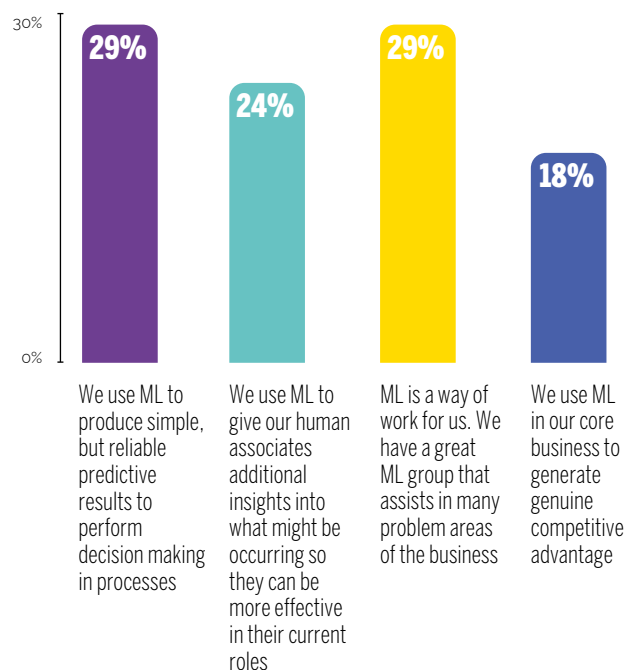
report that there is a disruptor in their industry. Most modern applications have an Electronic Data Interchange (EDI), Applications Programming Interfaces (APIs) or perhaps an XML hub that enables access to data that might have otherwise been difficult to get access to. In addition, the capabilities brought by RPA to engage with systems in many ways such as through the user interface or using surface automation (where the interface is treated through its visual representation like is required on old mainframes or Citrix). The net-net of this general ability of improved access to enterprise data means vastly improved likelihood that the data needed to fuel the ML models can be provided. One thing to note is that almost one-fifth of those responding in a recent survey report using ML for genuine competitive advantage.

When hearing claims of AI enablement in automation systems, it is useful to understand:

1. What kind of intelligence is needed
2. What level of analytic is being produced
3. Precision about what job you need the intelligence to do
4. The nuance of performance

This will help ensure that the shepherd boy is a hero most of the time, and the worst result is that everyone is fine.

If you use ML (skip if you do not), where do you use it most?





Robotic Process Automation (RPA)

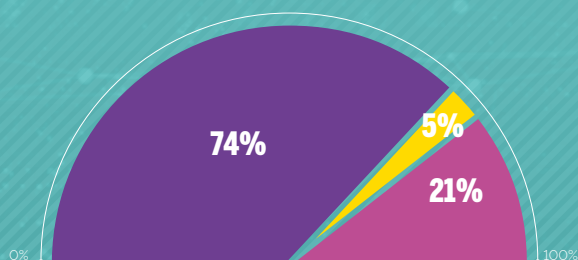
For business exceptions, most RPA platforms focus on simple “missing data” cases. Popping up a “Human In The Loop” data form is straightforward for any credible RPA platform.

The sophistication comes where difficult business decisions need to be made, or a further customer interaction is required. For these, augmenting the human part of a process with real-time guidance, compliance and business rules is the best way of handling those exceptions.

It seems fitting that RPA is a trend in intelligent automation. Like every technology on earth, the pace of advancement is one speed: faster. Almost three quarters of surveyed businesses believe in the core business value proposition of RPA and another 20% believe it is real but may be overhyped.

Do you believe in the value proposition of RPA?

● Yes ● No ● Some, but it is over-hyped



Source: SSON's Intelligent Automation Market Report Survey (Q4 2021)

With such overwhelming evidence of value from RPA, there are five areas worth mentioning:

- The Evolution of RPA: “Platform-ification”
- RPA in the Cloud: The Opportunities and Challenges
- Consider when Purchasing: Connectors
- Consider when Purchasing: Security
- The Biggest Challenge to RPA: Workflow (a.k.a session independence)



Q&A with

Gareth Hole

Director, Robotics & AI, NICE

Q. What skills do new users of RPA platforms need to have in order to orchestrate workflows

A. The required skills for new users of RPA platforms are becoming less technical as RPA control tools evolve. The best tools can now orchestrate across attended, unattended and analytics capabilities in a single place, ensuring that new users have the level of control they need without having to learn multiple platforms or require technical training.

Q. How does an RPA workflow orchestration platform interact with existing applications in an enterprise?

A. It's important to have wide-ranging connectivity to existing applications. Not just "computer vision" but object-based connectivity that can deal with multiple instances of the same application being open and users performing actions on the desktop as the robot works.

Q. What can be done to reduce exception handling in workflows?

A. Exception handling is a spectrum from technical to business. Automated monitoring of the platform can reduce technical exceptions by ensuring the right resources are available, including numbers of robots, system availability, queue depth etc.

The Evolution of RPA: “Platform-ification”

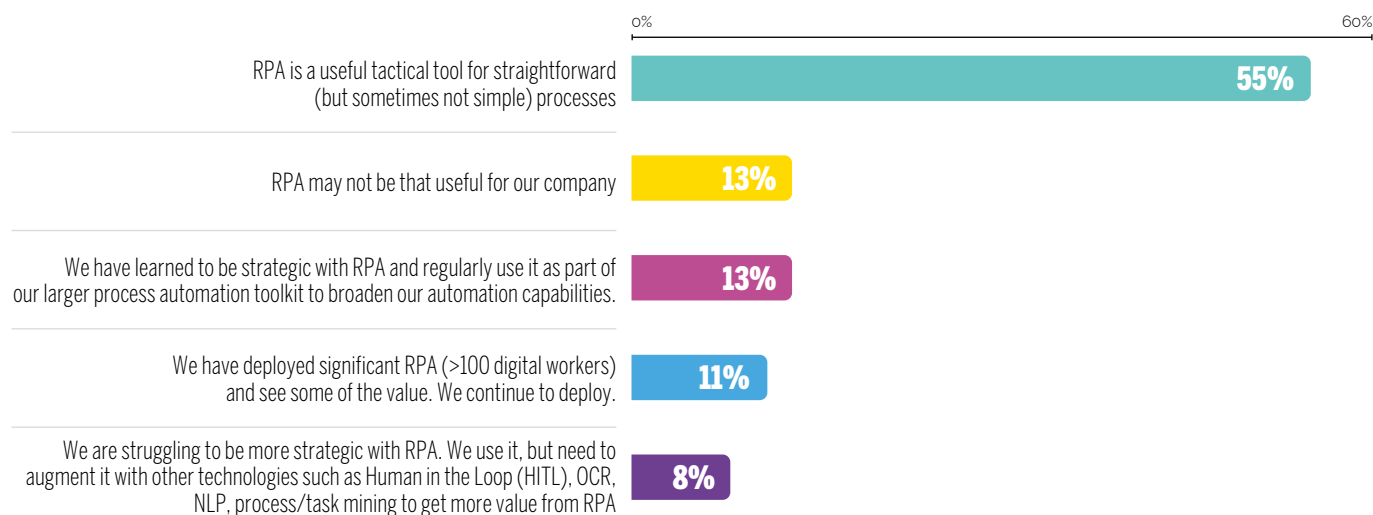
As the capabilities of RPA continue to expand, it becomes important that RPA products make it easier to engage with necessary adjacent and related capabilities. Whether it is to be able to accept process models designed in another process management tool (using BPM models to feed RPA systems), integrate OCR capability, or pipe data out for use in ML; today's RPA tools are evolving quickly. They are becoming a platform. Hence the word platformification. That is a word being borrowed from the financial industry to mean seamlessly brings together all of the capabilities needed to conceptualize, design, build, model, test, deploy, control, monitor and “self-heal”. Instead of being a closed ecosystem that was essentially hardwired together, today's products are becoming platforms where interconnectivity is vastly simplified, and enterprise is not limited by the inherent capabilities of the one product.

A useful example is consuming OCR as a service. Some products come with OCR “built-in” to the product. This might prove a limitation depending on the type of OCR a particular company needed. Not all OCR engines are created equal. Some are far better than others at certain tasks. Today, there are highly sophisticated OCR capabilities available as a webservice delivered in near-real-time for amazingly low cost that improve daily. It is probably unrealistic to think the RPA provider will become or remain a leader in all things OCR or even just make a bet on one OCR provider.

An example might be handwriting recognition. Is one provider better today than another? Is there a disrupter that will emerge next year? The ability to use a handwriting recognition web service may yield better results when you can change one provider for another with ease. Taking some literary license, the “platform-ification” is the ability to bring to bear a suite of interconnected tools as opposed to an application that has a suite of capabilities is the direction things are going. This greatly expands the utility of RPA tools. Today, more than half of companies surveyed continue to use RPA as a tactical tool, however a growing 20% report that RPA has become strategic or will become strategic as its capability is expanded.

Making platformification more complete and more useful is the ease of integration with an extensive community of established partners in the RPA makers' technology alliance programs. These tech alliance partners are all selected with a rigorous process of evaluation as to the utility of the technology capability to the end customer. If that capability makes the cut, and there are not already five other providers of the same thing, then the technology teams get together to create easy ways to integrate the two applications. By virtue of the platform strategy in RPA products, more standard interfaces mean it is easier than ever to connect new vendors that may or may not be in a particular RPA vendors alliance network.

What are the primary challenges you face in getting the promise of your RPA program?



Source: SSON's Intelligent Automation Market Report Survey (Q4 2021)

RPA in the Cloud: The Opportunities and Challenges

Cloud contributes to two of the themes. One is in the movement to the cloud for RPA products. The second is the abundance of other cloud based capabilities that are more easily interfaced to a cloud native RPA technology. It is worth mentioning here a couple of nuances about the cloud. There is no question that cloud is transforming automation to be an "as-a-service" product with all that this implies about the reduction of technical debt (because application maintenance is being provided) and the availability of new features on a quarterly basis. While is a game changer for certain, there are a few thorns on these roses. Among the thorns:



Data
management



Security



Migration

The first two are straightforward. Where is your enterprise data at any and all points in time? Is it secure? These are keen questions in today's cyber *in*security world. Becoming comfortable with how data is managed in the cloud is not easy and it requires a product security roadmap that continues to evolve as needs change. The good news is that cloud RPA products are today used by some of the most discerning and sophisticated users in banking, defense and healthcare. While not an endorsement, but it is certainly an important indicator of performance. If the top security teams in today's most data-sensitive industries were satisfied, then it probably will be ok for the rest of us.

Migration is worth addressing. It is worth noting because rarely is it truthfully an actual migration; at least not in the typical way we think about a migration. RPA companies might provide a migration path, but in truth cloud native applications operate fundamentally differently from their on-prem ancestors. While the two "versions" might present a very similar set of capabilities, the underlying code is quite different. The reality is that some things you can do with the on-prem version are simply not possible in the cloud version and vice-versa. The word "move" is more accurate than migrate. This is more like moving from a single family home to condominium that simply getting an upgraded single family dwelling. As an owner in the condo complex, not all decisions are yours to make and you are living in floorplan that is shared with others that have common management systems behind them.

Another useful analogy helpful in thinking about a move to a cloud version of RPA is that this is not like translating a food recipe into another language for use in a different kitchen by cooks that speak a different language. It is more like cooking at high altitude where the recipe literally needs to change in order to get the close-to-same results. And some things are unique to both environments. Some things work better in high altitude and some things at sea level.

Consider when Purchasing: Connectors

The third trend in RPA trends is connectors. As has been discussed RPA products are being turned into platforms. Further, RPA needs more and better access to more systems for transacting and data manipulation. The net of this is there is demand for more "out of the box" access to today's major applications. When enough connectors are available, this can become an integration platform. If cloud enabled, it becomes like Integration Platform as a Service (IPaaS). When it comes to rapid deployment of automation or removing the brittleness in automation, few things help as much as having a ready built set of connectors built at the object level. A simple illustration. An object has been defined as "Log on SAP" or "SAP Invoice". Instead of configuring the specifics to log on to different versions, a connector can be called that automatically discovers the SAP version and structures the log in request consistent with that version. Or if you want to connect to a customer invoice in SAP 6.x or SAP HANA, you simply call the SAP Invoice connector on the RPA platform and leave the translation to the connectors. The last five years have seen many companies develop these objects over and over. Approaching this need from an object perspective results in connectors; lots of them. This growing body of connectors is enabling faster development, deployment and more resilient automation that is tolerant to change as the applications evolve in the enterprise. If something new comes along, all that is needed is to update the connector. Instantly every automation that needs to do X, is updated at the same time saving a lot of time and effort.



Consider when Purchasing: Security

A topic that could certainly win as the most important for many is security. Security in general has continued to become more difficult as bad actors see their own nefarious capabilities advance along with, or even at the leading edge of general technology. Security isn't just one onion with many layers. There are many onions, each with many layers. A brief look at the different aspects of IT and cybersecurity is daunting. Below are few "onions" with their layers (not an exhaustive list):

Physical	User	Data	Action
Human Layer	Environmental design	Storage	Obfuscation
Perimeter Layer	Access control	Encryption	Prevention
Network Layer	Intrusion detection	Transmission	Detection
Endpoint Layer	Personnel identification		Response
Application Layer			
Data Layer			
Mission Critical Assets			

The good news is that RPA products are used in every industry, notably banking which drives much of the progress in security. From the beginning and through the entire existence of RPA, security has been a top hot button for buyers. Often one of the first steps in assessing an RPA product is its security. RPA has done a good job with security. While there are exactly zero publications of how often or how severely this security has been tested in the last few years, the talk around the watercooler is reassuring. What is notably missing is mass breach notifications and press about contentious liability battles with respect to RPA. As the uses of RPA (and any inherent risks) have expanded, the demand that it remain secure has never been greater. Cloud-based RPA adds a whole new set of security requirements. Security is an essential and core capability for RPA to remain relevant as a product category. It is a topic that is front and center in every customers mind and RPA providers are all over it.

The Biggest Challenge to RPA: Workflow (a.k.a session independence)

Workflow is one of the biggest challenges in RPA and is the last of the major themes in RPA. Automation is all about workflow. From the beginning, workflow has been central to the capabilities of the product group. There are three ways to think about workflow in RPA

1. Internal workflow
2. Merging into and out of enterprise workflow systems
3. Interoperability

The ease of use for managing the workflow created by automation has continued to advance. Tools for rapid deployment of human interaction (Human In The Loop or HITL) workflow are available now. These tools allow for easily configured and secure ways for an automation to interact with people. As was discussed in the AI section, using intelligence now to provide orchestration to the workflow is now a part of most RPA platforms as well. Another key piece of capability is now found either directly in RPA products or available through an alliance partner, is the ability to manage sessions. In this context a "session" is the start-to-end workflow with a user or to any application. Real time applications like to interact with real times sessions. The world is simpler when a session is initiated and concludes neatly as a single session. What happens if an application is not available at that moment? What about when a person is not available? Or when a session is interrupted or delayed for an extended time?

Take the case where an automation needs to pick up some data in a spreadsheet in a specific location. What happens when the platform finds no file or a file with no data in it? Or another case where an automation had to bail out and go get some direction from a human. The ability to manage all of these sessions to applications, data and people is essential. Now, intermittent sessions (those separated by long/unpredictable times between activity) can be made to appear as realtime. Synthetic session management is now widely available. Sessions can be made to appear to each application as that application expects. Similarly, automation processes can be held in stasis, keeping all sessions in what appears to be an active state, while waiting on a single session to advance or conclude. Sessions can be concluded, and restarted all the while maintaining the appearance of a real time session that was never interrupted. Performing these tricks while maintaining the security of all data involved is non-trivial, but essential as we move to intelligent automation.

In Summary

RPA ushered in a new era of capability in process operations a couple of decades ago. It provided a low barrier to entry and required little help from IT. Business reports that at least one third of the time, it is business sponsorship that remains the key to unlocking more RPA value.

There is a lot of conversation about where the RPA industry is going long term. There is little doubt that despite the noise about where RPA will finally rest in the world of enterprise software, the RPA providers have not been standing still. RPA platforms are easier than ever to connect to legacy systems, are more secure than ever, and are evolving into platforms in their own right while creating even more opportunity with a move to the cloud. All of this advances the march toward intelligent automation.

CASE STUDY: The Environment Agency: Automation Works Wonders with a Public Sector Legacy Infrastructure

The Environment Agency is the environmental regulator for England. It is the largest of 33 agencies and public bodies that make up the Department for Environment, Food and Rural Affairs (DEFRA). It employs about 10,600 employees in locations across the country.

The Challenge

The Environment Agency established the National Permitting Service (NPS) which employs >450 people, with approximately 50 FTE of this number involved in completing a range of key administrative tasks and support, including checking that applications are complete and fees paid, updating legacy permitting systems (vital for billing income), electronic document management, administratively issuing permissions as well as more complex and individualized tasks like determining lower risk permit alternatives. The service is also operating an IT ecosystem of both modern digitally transformed applications, alongside legacy permitting tools, from as far back as the early 1990s. This means that key administrative tasks are not always user friendly and that connectivity for any process automation is challenging.

The Solution

The regulator chose to incorporate automation into the workflow for the administrative issuing of permits, as the administrative handle times for the service range from 45 minutes to several hours, dependent on the type of permit. The process has relatively low volume, but very high complexity and back office effort. The Environment Agency determined that the NICE Robotic Process Automation (RPA) solutions had the flexibility and capability to meet its requirements.

The NICE Attended Automation solution was implemented for all 68 NPS desktop stations within its centralized administrative function within its National Permitting Service. Integration with the legacy Citrix environment was particularly challenging for connectivity reasons, but this was overcome in collaboration with NICE and its partner, Capgemini. Capgemini also ensured access to key build and live service support for the NICE product.

The Outcome

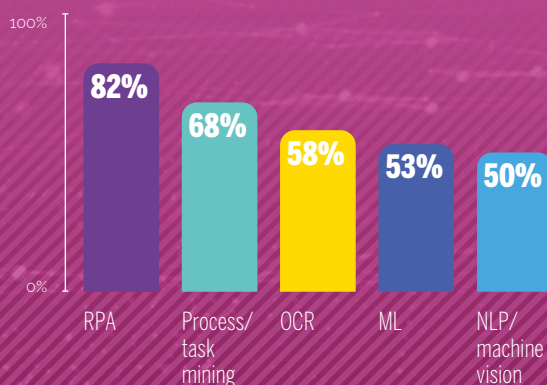
- Staff spend less time interacting with outdated legacy IT.
- A significant productivity gain with reduced average handle time for processing water resources permits from 65 mins to less than 7 minutes.
- More accurate permits, greatly reducing the volume of subsequent procedural failures and re-work.
- Reduced complaints from the public
- Improved data quality in legacy permitting systems used during compliance and enforcement activities.



Business Process Automation (BPA)

Before the rise of RPA, when an enterprise wanted to do process transformation, this would typically have been done it using a Business Process Management Suites (BPMS) or Business Process Automation. It can be a bit confusing with different designations for clusters of capability. Terminology gets thrown around without regard for user confusion. RPA, BPA and BPMS are victim to this as well. As generally defined, BPA is the ability to significantly automate End-to-End (E-E) processes. However, where is the line? In a recent survey, respondent right observed that BPA is a broad space.

Which (check all that apply) technologies are considered a part of BPA?



Source: SSON's Intelligent Automation Market Report Survey (Q4 2021)

BPA and BPMS can be thought of as cousins.

It is generally correct to say that the set of capabilities for BPA exist within the broader BPMS platforms. A way to think about the difference is:

- BPA is primarily focused on using a software platform to automate or replace manual processes
- BPMS adds important additional capabilities such as process visualization, process transformation strategies, No-Code/Low-Code (NCLC) application deployment, and production process management that are applied to manual processes and automated processes.



Q&A with Anurag Shah

Head of Solutions Engineering, Newgen Software

Q. How should the success of BPA in Shared Services be measured?

A. The success of shared services is not a yardstick or goal post. It keeps evolving or maturing throughout the journey. The initial goalpost is to overcome the current challenges, while extended goal posts could be to come at par with peers and then to be a market leader. Each shared service is based on a vision that is translated into business outcomes. While the cost of operations is the key objective, a lot of tangible and intangible aspects support the outcomes. Suppliers and vendors being the customers of shared services, their experience of engagement must be central to the success.

Q. Why should enterprises go for a low-code digital platform instead of completely off-the-shelf (COTS) products?

A. Shared services are an enabler and shoulders equal responsibility with business in strategic and tactical aspects. The business is extremely dynamic these days, which makes it imperative to continuously innovate and be agile and nimble. To introduce new innovations as part of a COTS product is time-consuming and requires coding and testing skills. Often, our thoughts are boxed in the boundaries that COTS operates. While a low code platform like [HYPERLINK "https://newgensoft.com/platform/"](https://newgensoft.com/platform/) NewgenONE enables out-of-the-box thinking, allowing for quick simulation of innovations and faster rollout, the pre-integrated content services and communication management modules become key to achieving seamless automation of processes. Embedded technologies such as artificial intelligence and machine learning help in increasing low and no-touch processing. Overall, the NewgenONE platform with low code capability enables iterative fine-tuning in line with the market needs as continuous simulation brings out the challenges, and hence faster time-to-market.

Q. When does BPA saturate? Is there a point when there is nothing to improve?

A. Process automation is a continuous exercise and keeps bringing value through innovative ideas and re-imagined stakeholder experience. SSCs have transformed themselves from being mere efficiency drivers to business enablers through continuous innovation and/or improvements to the business processes.

The initial focus has been on bringing efficiency to the business process and increasing the productivity of employees. The incremental focus has transformed shared services into global business service (GBS) centers. BPA has gone beyond internal excellence to external stakeholder experience and is now inching towards the end-customer experience – that for vendors and suppliers. Digitalization is means, not the end. As we talked about extended goalposts above, digitalization continues to raise the bar after each milestone achievement, which implicitly or explicitly results in either cost saving or revenue enhancement—all this with customer experience in the center.

Where BPA might stop at changing an automated process (one already largely performed by existing systems of record), the BPMS approach is more wholistic, taking into scope all elements used in the E-E process regardless of where the processing is currently performed. Evaluation of what parts of the process are currently processed inside of an ERP or other enterprise system is an included part of the scope. Significant improvements can be gained by removing select portions of processing by legacy systems and replacing it with other applications. This could be from capability from within the BPM suite of tools, or LCNC apps. These low-code-no-code apps are developed specifically to replace, enhance, and improve process operation and enabled by the BPMS. By replacing key parts of already automated processes with updated technology or LCNC apps provides a level of insight and data that can also allow for real-time reporting and response. This process resilience is typically reserved for the BPMS realm.

Another distinction between BPA and BPMS is the place it occupies on the enterprise strategy priority list. In terms of magnitude, implementing BPMS is more like ERP or an enterprise application implementation. It is an eight digit investment requiring a sustained multi-year program that becomes a new corporate capability. Because of that, similar approaches are used for BPM or ERP. It is a fundamental reimagining of the E-E process or functional areas. The starting point is often that manual processing is a choice of last resort. A new process model can be adopted that works to isolate and concentrate workloads that are performed well by different technologies. Longstanding limitations in the legacy system architecture are back on the table for re-thinking.

While BPA is not BPMS, much has been changing. In the last several years, the industry has witnessed strategic acquisitions where BPMS companies have acquired RPA businesses and RPA companies are deploying BPMS capability. It is not unusual in a technology field such as intelligent automation. IA is not a one-trick pony. It is a suite of capabilities that can be assembled in a number of ways. As companies progress along their own set of strategies, capability is expanding. Acquisition is certainly one way, but internal development investment as well as strategic technology alliance partnerships are all viable ways to assemble an ever broader capability. A way to think of it is RPA providers are swimming upstream into the BPA world (greater impact and strategic benefit) and

BPA companies are developing more BPMS capability. The flipside is also true. As noted earlier, some of the BPMS firms have acquired or developed broader RPA and RDA capabilities.

A common feature in BPMS and BPA firms is also a degree of specialization. That specialization can take many forms. It often takes the shape of special vertical or horizontal solutions. A company born or proven in banking is likely to have developed solutions targeting pain points common to banking, either in clearing, reconciliation, payments, consumer finance, or mortgage. A firm born in customer care may have deep capability in call center, self-service, order to cash, service-based-upsell and so forth. It is impossible to be deeply expert in everything, so there is often an approach to be good in BPA while being expert in a few areas where BPMS levels of transformation are performed.

BPA providers bring the capabilities discussed here (OCR, IDP, ML/AI, and NLP/G/U) and more together in an integration platform. The depth of integration among the different components is an important factor to consider. It takes time to fully connect the varied technologies in a meaningful way. It is also important for BPA companies to sort of "declare" where they will compete for native/internal capability leadership. There are far too many places requiring major investment to be in a leader in more than a handful.

The key to a strong BPA provider is:

- Strong integration platform
- Native or acquired key technologies in a few logically affiliated fields
- Ease of use for integrating external services (e.g., OCR as a cloud service)
- Strong technology alliances where internal investment is not top priority
- Well defined areas of expertise or leadership
- Track record of success in certain vertical and horizontal specialties

The trend in BPA recently has really been in the completeness of the offering and that will continue. This also typically includes offering more capability that would more traditionally be in the world of BPMS firms. The distinction between BPA and BPMS is blurring. Another

growing trend is in the development of deep partnerships with the high-end management consulting firms. Let's be honest, when the Board supports management in a major transformation involving technology and operations, it is not usually a technology firm that gets the first call. That first call is made to the top tier consulting firms and sometimes the top tier Global Systems Integrators (GSIs) who have the deep experience needed to bring best-practice operating models, process models and experience with different technologies.

When putting together a program office for transformation and selecting a partner(s), it is common to combine consulting with process leadership in your vertical along with more than one technology. There are just too many different areas to be an expert in. The trend is often quite literally for providers to "lean out" of certain areas or verticals where it is not likely it can be a top performer. If one firm is not that strong in one vertical, it is wise to "lean out" of that area and help any existing customers move to a friendly alternative provider (often with a commercial relationship). This ensures that they preserve a focus and define a space where they can be differentiated. The goal is to spend scarce investment dollars where the company is strong and can sustain a level of investment needed to be in the top quartile or decile. The field seems to favor a provider with solid fundamental performance and top-tier performance in specific areas.

This has implications for how one might choose a BPA provider. Beyond the typical, some key factors to consider:

- Demonstrated strength in your vertical or process/function
- Matching core technology strength with customer top challenges
- Strong technology alliances
- Great relationships with your management consulting partner
- Track record of satisfied and long-term clients in your vertical

A final trend worth mentioning is no-code-low-code (NCLC) capabilities. This is an emerging field with lots of players, none really dominating, and lots of new entrants. NCLC is a new way to create and deploy functionality dynamically to your business. However, there are some serious prerequisites to be able to do this. A seriously oversimplified way to think about it is like developing Excel Visual Basic scripts on your desktop. It is not possible without running Excel first. The same applies but it is orders of magnitude more complicated. A company has to first be running the platform. A considerable effort is involved to develop the base infrastructure, mapping, beacons, object creation and data management before NCLC solutions can be used for more than small tactical solutions. NCLC application capability is common with BPMS providers and is increasingly common in BPA providers and is beginning to emerge from RPA providers as well.

It is an exciting time for sure in the BPA space. Established industry leaders are competing with new entrants and others are swimming upstream into their waters. Specialists are expanding their breadth, and generalists are narrowing their focus to compete and win where they can lead. As was mentioned with the similarity to ERP, a key to a successful BPA based transformation usually has less to do with the technology(ies) than with the internal change management and organizational agility to pivot to a new way of working.



CASE STUDY Global Beverage Manufacturer Streamlines its Financial Shared Services

The client is a leading global alcohol beverage manufacturer with multiple brands. The company was looking to centralize and standardize processes across its 5 global in-house centers (GICs) - India, Hungary, Columbia, Kenya, Philippines. It wanted to track and maintain thousands of invoices by streamlining its accounts payable (AP) and accounts receivable (AR) processes.

The Challenge:

There was a lack of standardization across processes and applications which resulted in silos, hampering the overall operational efficiency. Unified roles and the absence of well-defined centralized processes created complexities. Further, the users faced challenges in managing exceptions and there was poor collaboration across internal and external stakeholders due to the vast scale of operations across geographies. Furthermore, the invoices were paper-based, which required a lot of physical movement across departments. This resulted in low control over the invoices, delayed payments and higher penalties. Therefore, the client realized the need to digitize invoices and enable paperless processing by minimizing human intervention and eliminating error-prone tasks.

The Solution

The client automated over twelve processes using Newgen's solutions covering more than 25,000 users. Now, the invoices received at any location are captured and their scanned images are sent to a common mail room. Relevant data and information from invoices are extracted, indexed, and validated automatically. Streamlined processes and smarter decision-making have enabled smooth collaboration amongst users.

Outcomes

Third-Party Integrations

- SAP
- COUPA
- Workday
- Salesforce

Scale of Implementation

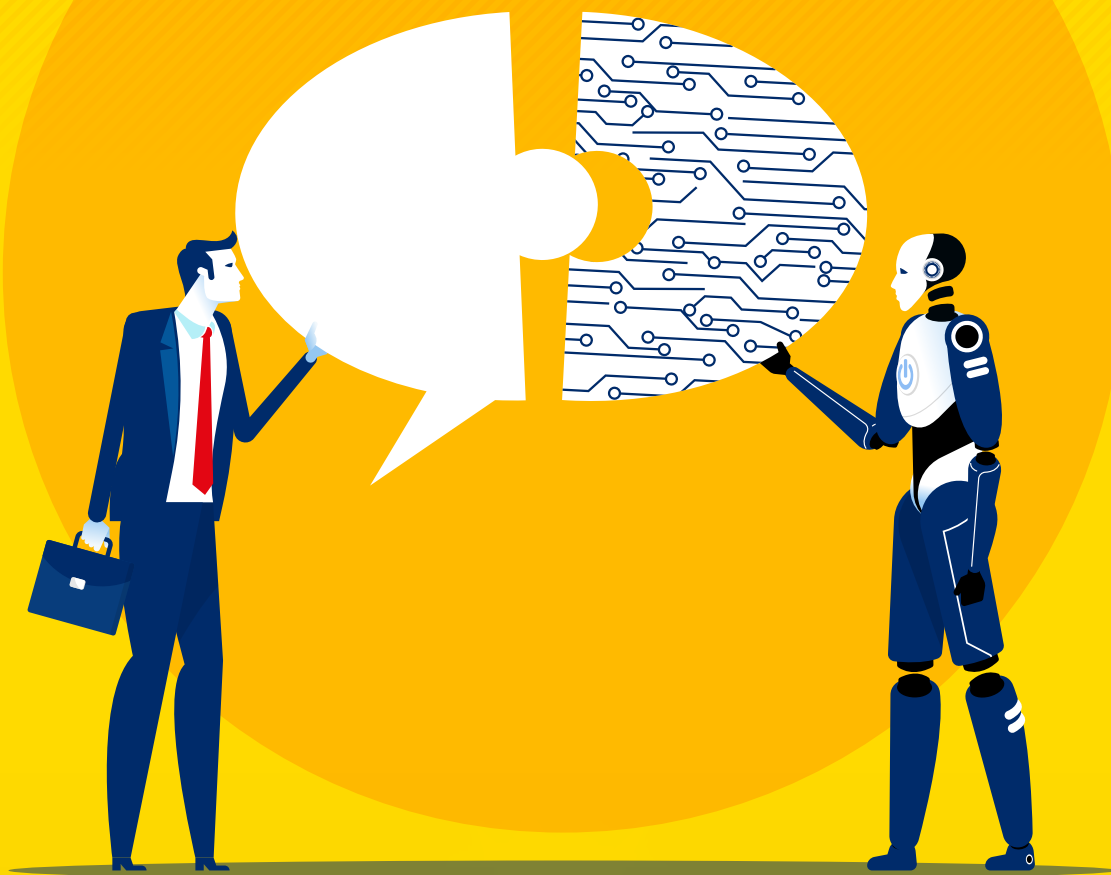
- 12+ Processes Automated
- 0.5 Million+ Transactions
- 25,000+ Users

Implementation Highlights

- 70% elimination of manual data entry
- 60% improvement in straight through processing for clean invoices /single line item invoices
- 60% improvement in processing efficiency
- 50% increase in full time equivalent (FTE) productivity
- 40% cost savings through FTE reduction and reduced IT operational costs

Processes Automated

- Accounts Payable
- Cash Management
- Capital and Risk Management
- General Ledger Accounting
- Cost Accounting
- Intercompany Accounting
- Record to Report
- Fixed Assets Master Data Management
- Vendor, Product & Customer Master
- Data Management
- Loans & Guarantees



Natural Language Processing, Generation and Understanding (NLP/G/U)

In a story similar to OCR, Natural Language Processing (NLP) has been around longer than most would guess. It wasn't called NLP at the time. It was born out of a wartime need to be able to translate between languages with machines. Driven largely by the intelligence and spy agencies of the world, the work was largely carried out under the Machine Translation (MT) heading led by defense and academic partnerships. It was initially postulated that direct translation could be performed between two languages. As we look at it now, it is not a surprise to conclude that after some initial efforts in the area, this would take more time to mature. Simply put, the technology did not exist that could do this kind of work. And it was not just the technology. The science of language was incomplete and not up to the task either. Despite science fiction writers and futurist predictions of natural language control of complex systems, the natural language part is hard: very hard. Perhaps it is predictable that less than 10% of enterprises reported using NLP/G/U in their business.



Q&A with

Ben Podbielski

2VP of Emerging Technologies, **Protective Life**

Q: How are you using NLP at Protective?

Q: NLP is being leveraged at Protective in several ways, including IVR, document ingestion, sentiment analysis, and contract analysis. We believe that NLP is a valuable tool in our quest to create efficiencies within our existing processes.

Q: How did you identify business opportunities to use this tool?

Q: As with any new technology, ideal use case identification can be difficult at first. Our approach was through education of our business leadership on the capability, to help them understand what it is and more importantly what it isn't.

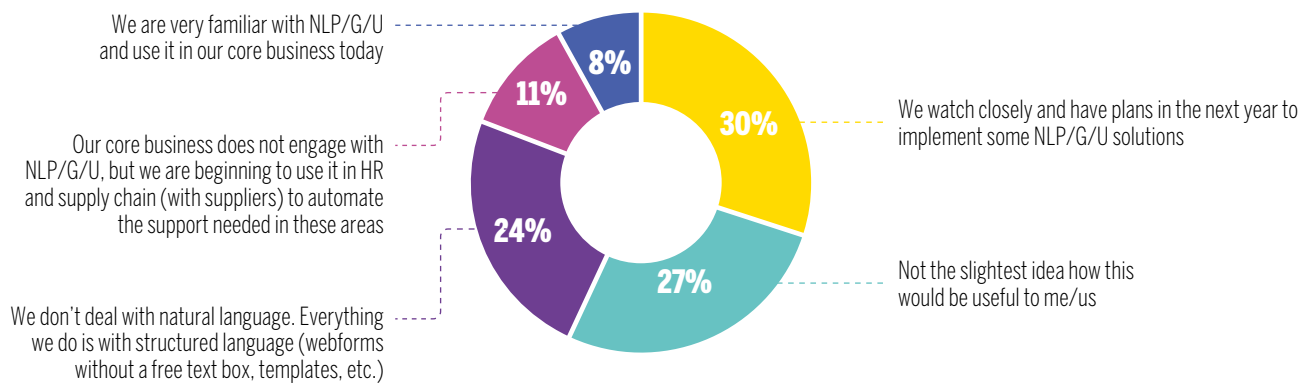
Q: How does NLP fit into Protective's broader automation efforts?

Q: NLP is just one of the many tools we are leveraging for automation at Protective. As with most other insurers, we are burdened with large amounts of unstructured data (physical mail, email, phone calls, etc) coming into the organization that needs to be turned into a structured format where it can be acted upon. We see NLP as one of the tools to accomplish this task, which enables further automation.

Q: Where do you see NLP heading in the next 5 years?

Q: A significant portion of today's data is unstructured, and as such, I see the interest in NLP only growing in the future. The biggest shift I believe that we are heading towards is the one where we are moving from a single medium interaction to a contextual conversation with an understanding of both verbal and non-verbal inputs.

To what degree are you/your company familiar with recent advantages in Natural Language Processing (NLP), Natural Language Generation (NLG), and Natural Language Understanding (NLU).



Source: SSON's Intelligent Automation Market Report Survey (Q4 2021)

Advancement of NLP slowed to a crawl through the 50s and 60s. It became clearer that NLP needed some big and sophisticated computing power and new, unimagined algorithms to be successful. The world needed to discover semi-conductors, transistors, and central processing units. Even then, early transistor-based computers could not tackle this kind of work. The 70s saw work done in linguistics essential to the space. Believe it or not, the first rudimentary chat bots were built at that time with incredibly narrow capabilities but served to show the potential of the field. It was late in the 70s, some of the pioneers (linguist Noam Chomsky and computer scientists John McCarthy and Ray Kurzweil) began to turn their whole attention to the task. The 80s saw much needed advancements in "symbolic methods" of representing natural language. Machine learning began to be applied successfully to NLP tasks in the 90s and it was truly in the 2000s that acceleration occurred. The PC and then handheld device changed the game while computing capabilities moved on exponential curves. The story doesn't end there. NLP it turns out is a whole set of interrelated disciplines and technologies that have taken decades to progress.

To set the stage, how many languages are spoken on earth? An unlikely guess would be about 6500. However, that is the truth of it. Even considering this number carries a somewhat arbitrary separation between a language and dialect, it is a lot. The number is larger still when including dialectic variations. Suffice to say that just transcribing a voice interaction into text is a challenge. At last count, there were also 3866 "forms of writing" or in simple terms, almost 4000 different "alphabets" known. As of this writing, Google supports the largest 109 languages and

that number continues to steadily grow. The technology to perform this miracle is now available via web services today at remarkably low cost. Such a low cost in fact for it to be nearly free. Nearly, but not quite. As part of the bargain, the provider gets to use and keep your inputs to continue to train their systems.

NLP is classified as a sub-discipline of linguistics due in large part to the fact that the language challenge is on par with the technology challenge. While language has fascinated man and much has been studied about language, the field includes some meaty dimensions that have taken a while to progress. In the broadest terms, NLP can be broken into five related fields:

- Voice To Text (VTT) conversion
- Natural Language Processing (NLP)
- Natural Language Generation (NLG)
- Natural Language Understanding (NLU)
- Sentiment Analysis

Each of these has a significant overlap with one other. They share a combination of forms of analysis that are used for different purposes. Each of these areas has a non-trivial level of complexity, and they often reflect back and forth requiring recursive analysis to perform satisfactorily.

First in line is a kind of prerequisite for all the rest: recognition. When presented with an audio recording or an image that contains text, determine the language text.

Speech Segmentation and Recognition

This is two primary capabilities: segmenting the language (either in audio or in writing) and then recognizing it. Most spoken language does not have useful separation between words. English (but not Chinese for example) has useful spaces between words in written natural language. The first challenge is to segment properly and the second is to recognize it and record it symbolically. Recall that symbolic representation of language (without respect to any technology) has been a discipline for 70 years.

Now that a voice (or image) input has been converted to text, it must be processed. This is both a content and context exercise. NLP is the science of divining the "purpose and payload" of communication. Many contextual inputs are needed to detect the specific circumstances relevant to the speaker at the precise time of utterance or writing. The language must be decomposed. Harkening back to memories from fifth grade literature class, sentences must be diagrammed to determine subject, nouns, verbs and so forth. Armed with the "essence" of the input, analytics do a pretty good job of determining the purpose and payload of the dialog. Significant advances have been made in recent years. Contract readers surpass human experts in finding problem terms in contracts in multiple tests. Technology is now conquering multi-

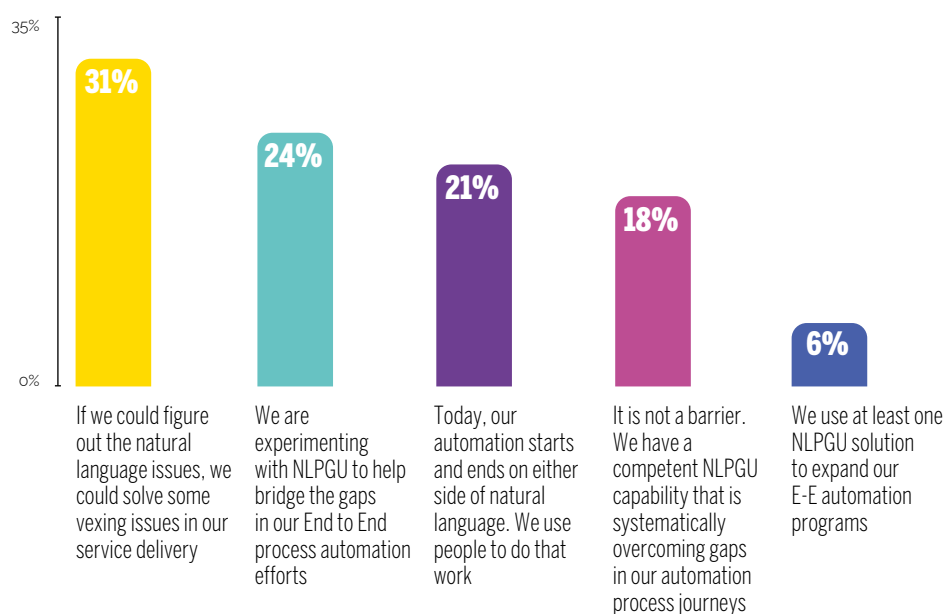
speaker dialog as well. Voice prints separate the speakers and with varying levels of success, the dialog is converted as an exchange and analyzed. This is made more difficult because of the recursive nature of the analysis. The previous dialog contributes context and meaning to each part that follows. Multi-speaker voice remains a challenge on the horizon, but exciting progress is being made.

Together, these technologies come together as NLU. That is, developing an accurate understanding of the purpose and payload of a dialog. With advances on all fronts of the language challenge, NLU is in now a part of the automation workbench. More than 30% of survey respondents report that NLU could solve important challenges for their business and a quarter report that they are experimenting with solutions.

Connecting these capabilities together is a powerful combination when applied to automation. It begins with Voice To Text (VTT) or OCR.

Once text and language are recognized, a whole suite of additional disciplines with corresponding technologies must be applied.

To what degree is natural language a barrier to your automation efforts?



Source: SSON's Intelligent Automation Market Report Survey (Q4 2021)

A Glossary of Language Components

Morphology or Morphological Analysis

This mythical sounding term refers to figuring out what meaning a word carries. The word "check" is a noun sometimes and means one think in banking, a is a verb meaning very different things in transportation. This includes "inflectional morphology", something English speakers use primarily to infer inquisitiveness with a rising tone at the end of a sentence. Other languages (Chinese, Taiwanese, Cantonese) use inflection as a primary component of meaning (with 5, 7 and 8 inflections respectively). Other parts of morphology include something called stemming and lemmatization (think of it as finding the root word and meaning). This is sometimes also called Pragmatic Analysis.

Syntax and Syntactic Analysis

The easiest way to visualize this is how to separate a sentence into clauses. Dig deep from 7th grade literature when sentence mapping was taught as a way to understand a paragraph or page or chapter. This is done primarily with a process called parsing. That is, looking for demarcations in written (or transcribed) text such as periods and commas (although, there are many uses for these e.g., now). As noted, verbal and written separators are inconsistent and variable.

Ontology

An ontology is a kind of representation, with formal naming and definition of the categories, properties and relations between the concepts, data and entities in language. Said another way, an ontology is a way of showing the properties of a subject area and how they are related to all others, by defining a set of concepts and categories that represent the subject. In the case of the word "check", it would be to define the industry as finance, the speaker as a customer, receiver as a banking agent, and the purpose as a transaction. It is more complex than that, but it provides an overview to what happens in ontological mapping.

Semantics:

- Lexical semantics (of individual words in context)
- Relational semantics (semantics of individual sentences)

Semantics is the big challenge of figuring out what a word should mean *in context*. This involves "word sense disambiguation". Related to morphology, words have many meanings. Semantics aims to identify the word in context of the surrounding words, and then the meaning of that clause or word cluster in the context of the sentence, and then in the larger context of the dialog.

Discourse

- Semantics beyond individual sentences
- Discourse Integration

This is the science of connecting pronouns properly with the nouns to which they refer. Beyond that, it takes on the challenge of considering previous text that may negate the meaning of that pronoun or alter it significantly. Think of the phrase "he said with an open heart". Only with referential understanding of previous dialog can an attempt be made to discover the intended meaning.

Sentiment (including non-verbal communication – real robots with facial recognition)

Sentiment is often described literally as unspoken. It is not possible to determine the full context of what happened in a courtroom simply from the court transcript. There are no tears, shouts, pauses, looks around the room or any of the other things that contribute to meaning. Yet sentiment is crucial. This is an amazingly important part of the context aspect in human speech. Two approaches to sentiment are used: one is an analysis similar to a voice stress analyzer used in polygraphs. This is used for calibrating rough emotional state that has a material impact on payload in the dialog and relies on audio analysis. This is not possible in written natural language processing. The second is language analysis and can be applied to document based NLP. This is word choice, spacing,

emphasis, and repetition. Much can be learned by measuring the use of specific words in combination, and the space between them or a speaker's volume getting higher and word rate increasing. Many modern call center agents today have a face emoji displayed on the screen during a customer call. That face changes between at least three faces (happy, neutral, unhappy) to as many as 12 different faces. Experts have generally agreed this is the number of commonly accepted emotional states relevant to most business transactions. The longer list includes things like confused, uncertain, or helpless.

This brief introduction to the complex concepts (and even more complex work to perform) is presented as a way to illustrate the related disciplines that must come together to perform usable NLP/G/U. Emphasis on *usable*. It is only recently that these systems perform well enough to be put into practical use. It was not

long ago. Google Voice debuted in 2009 and Siri in 2011. Remember the ridicule and endless jokes from the results of these early systems? Just 10 years later, Google processes more than 100 billion words per day. 27% of all online searches were initiated with a voice request in 2020.

Natural Language Generation (NLG)

Turning these capabilities outward is just as important for NLG. NLG is the ability of a system to create reasonably understandable text or audio (using a Text To Voice (TTV) engine – yet another technology in the voice field) to deliver a purpose and payload to a person including inflection if it is part of that language. Adding a few new complexities, but largely drawing on the NLU capabilities, NLG is becoming an important tool in the automation world.

In Summary

The next time you call your airlines or a retailer and can completely get your needs met using their Voice Response Unit (VRU), you will know you are experiencing sophisticated technology operating at near real time to understand the purpose and payload of your request, and respond back to you with the right answer or action.

The trend in NLP, is *the use of NLP*. With large scale practical uses of NLP really arriving in the last 10 years, the trend has been to apply them. There are many places in an enterprise where a request is initiated by voice or natural language text (think of the free text box that comprises 90% of that webform you filled out to open a ticket with company X). Further, there are many places in process operations where natural language is routinely used to resolve requests. Not surprisingly, natural language is

often central to the most frustrating and friction heavy processes in a company and is almost always present when something goes badly wrong.

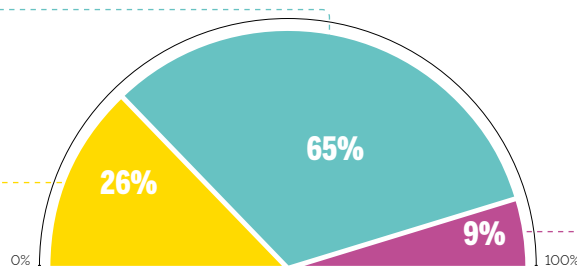
The key takeaway is that NLP/G/U is now mainstream. There are some misconceptions in the market that consumer NLU is superior to enterprise NLU, however it is being deployed to great effect in intelligent automation systems today.

That NLP will continue to improve is a given. It will only become richer as video is becoming a dominant form of communication in our society. The contextual information in video when paired with NLP is on the horizon. Like most advanced technologies, it is in use today, but won't be experience widespread adoption for a couple of years.

How do you believe that NLPGU capabilities for business compare with consumer capabilities?

Any business can consume NLPGU capabilities as effectively as the consumer market

Consumer NLPGU is way ahead of business NLPGU



We have access to the latest and greatest NLPGU tech. Our business takes leading-edge NLPGU capabilities (regardless of origin) and puts them to work solving the text/voice use-cases of our business.

Source: SSON's Intelligent Automation Market Report Survey (Q4 2021)

Wrap Up

The Pace of Play

The Gartner adoption curve has stood the test of time. Intelligent automation is the newest and most recent category of enterprise software to come along in a few years. It will follow the same disruption and adoption curves that previous technologies have. What is not known is how quickly. Probably the most significant trend in IA is that the industry is on the cusp or some say we have already entered the "Early Majority" phase of technology adoption. This is a big deal. The cycle really began in the early 2000s, but this automation technology didn't even have a name until the 2010s. It went from a niche disrupter product in 2012 to the hot new tech in 2015. Staying on pace, the last three years have seen a remarkable advancement.

Just as the industry was maturing and the proof of value was being validated, the world entered a global pandemic response footing.

COVID accelerated automation adoption and more importantly, it reduced the hurdle to experimentation. In response to unforeseen circumstances, enterprises were more willing to experiment with technologies that were not yet proven. Even if the initial tests and experiments did not deliver the level of value being anticipated, automation showed what it can do. Lessons were learned, awareness was raised, experience was gained. This opened the door for IT to come have a closer look. Unable to deny that automation can solve many kinds of problems, it moved to a permanent place on the toolbench; now a piece of a larger set of technologies aimed at "digital transformation".

Trends in scaling automation are starting to emerge. A lot of airplay has been given to the challenges of scaling RPA and how so many programs are still less than 100 digital workers. There is truth to that. It is easy to deploy "brittle" automation. That is automation that is very susceptible to changes in the environment. It breaks easily and is costly to maintain. Changes to enterprise systems seem almost non-stop. Poorly built automation does have a tendency to break. Additionally, competing priorities have slowed the spread of automation. While finance may have had great success with automation, the customer care area

already has two major change initiatives so automation will wait until time and money allow. While automation is on the list of priorities, it hasn't made it to the top three to be put into action.

Yet, there are enterprises operating with more than 1000 digital workers and a few striving for 10,000. Working together, providers, customers and advisors are solving for the challenges to scaling. Bots or digital workers or digital labor are all terms used to try to describe the kind of contribution automation makes to an enterprise. A useful and well understood unit of measure is the "full time equivalent" or FTE. We know what a person can contribute so it is a convenient ruler with which to measure what IA is contributing. Both automation and human labor carry a cost as well so it is relatively easy to establish a measure of value.

The early adopters now are moving firmly into intelligent automation and scaling. They recognize that automation is in fact opening the door to a whole new source of labor; one that is increasingly versatile. As IA integrates more functionality needed to create sufficiently broad use cases, the utility of digital labor is growing exponentially.

Another trend worth noting is the presence of the Small and Medium Business (SMB) segment in automation. SMBs by their nature are generally a little more adventurous but they have been slow to join the IA bandwagon; with good reason. They are starting to see automation's potential for their business. While they may not pursue automation for scale productivity (reducing costs), the use-cases for freeing up skilled labor and improving speed/quality/experience are quite attractive. SMBs have a different reality. By definition, they are not large enterprise. They cannot afford to invest in developing a twenty person COE to drive automation. As a result, their buying patterns are different. An SMB is more likely to purchase "turn-key" automation. That means SMBs are purchasing packages of services and software. The services highlight the best opportunities, build the automation, and either hand back the production automation or as is occurring more frequently, paying a provider to do basic production management

Industry moves

As the newest category of enterprise software, most analysts call it something like business process management and automation or something similar. As has been discussed, this encompasses a body of related technologies. In the short time it has been around, it is approximately \$8B today and on its way to \$22-\$25B by 2026, growing at 11-12% CAGR. That is a sizable market. RPA alone makes up about a quarter of that – expected to be right around \$2B in revenue in 2021.

A new market with growth like this draws the attention of our friendly investment bankers. With many new entrants, established startups, BPO providers and GSIs all involved. There is money to be made and founders and leadership teams need money to grow. Supply meets demand. The influence of these investments on the shape of the industry is significant. Private equity is quite active in the space at all levels of investment. Some are looking at platform and rollup opportunities, others looking for software and cross sell synergies, and always the strategists are on the hunt to fill out their own capability or geographic footprint. Below is just a sampling of acquisitions currently underway or completed in the last 18 months. It is by no means an exhaustive list.

Buyer	Target
UiPath	Cloud Elements
Hyland	Another Monday
Vista/TIBCO	Blue Prism
AKOA	Roboyo
TPG	Nintex
Kryon/ABBYY	NEKO
ServiceNow	Intellibot
Ashling Partners	Machina
ISG	Neuralify
Salesforce	ServiceTrace
Microsoft	Softomotive
IBM	WDG
BP3 Global	Agilify/transformAI

It tells a story of a vigorous industry with a lot of moving parts. A message for the buyer community is to be sure to look at your software and service providers from the acquisition perspective. Not just who they might acquire but who might acquire them. Ask what it might mean for you if anything.

A list of private equity firms active in the IA space would likely take up a couple of pages and still miss many. PE firms large and small are taking a keen interest in the IA space. It is difficult to establish trend lines in market moving this quickly and still so young. Anecdotally however, industry mavens are saying that there is a lot of money active in the space. Good businesses on a solid trajectory will not have a hard time finding growth capital if their business fundamentals are in decent shape.

COVID certainly threw a curve ball at the space in 2020. Everyone was holding their breath to see what impact, if any, COVID was going to have on the IA market. In a similar fashion, much of the IA market also experienced a prolonged buying pause as customers were dealing with their own business crises. It appears that confidence has returned and money is once more flowing into IA. At least for the near future, acquisition and investment will continue at least at the current pace.

The Rear View Mirror and the Windshield

Sometimes watching recent history can be a reasonable predictor of what is coming. That is the case with IA. Things that began in the last two years can reasonably be expected to continue or accelerate.

Migration to the cloud.

While some customers are not embracing cloud-based IA solutions, many others are. The ability to consume IA as a service from the cloud has many attractive qualities. Consumption based pricing, access to new capabilities quickly, and a reduction of technical maintenance debt are strong motivators.

RPA morphing into IA

Server based unattended automation (original RPA) has shown what it is good at. It has also shown that there are lots of adjacent technologies that can dramatically expand the use-case. Whether the end-customer assembles an ensemble cast of tech to get the job done or the provider does, it is certain to occur.

Platform-ification

In the migration from RPA to IA, it is clear that providers with strong integration between tech capabilities are winning. Customers want to be able to buy from just a few (more than one, but not ten) providers to fill out their transformation workbench.

Increasingly intelligent

As applications become "data-aware" and can send the data fuel needed for AI/ML based orchestration, the complexity of the use-case/workload will continue to expand. There is work to be done here, but recent developments predict a strong bias for more intelligence.

Scaling

The last few years have seen users of IA scale to more than 1000 digital workers. There is absolutely a demand for technology that can scale to 10,000 and even 100,000 DWs. It is rare to find a user of IA that will tell you they have no intention to grow their use of digital labor

Part and parcel of the digital transformation

While trying to find a solid definition of digital transformation can be like grabbing soap suds, there is no question that one of the bubbles is intelligent automation. The industry is rapidly evolving and terminology notwithstanding, what IA does is definitely a part of the DTx agenda.

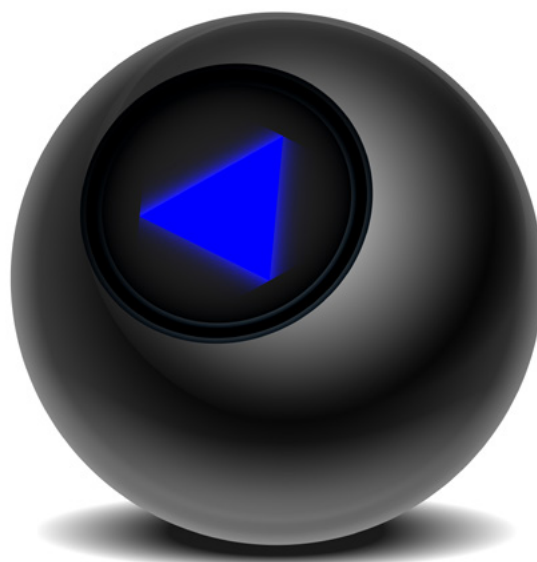
Magic 8 ball

RPA and its progeny IA are racing forward. Since it took the spotlight as the darling of business tech, ERP makers and those commonly thought of as "big tech" have had an interesting response. In the beginning, the loudest voices were saying that this is a flash in the pan and no responsible company (perhaps trying to shame the early adopters) would install such brittle and unproven technology in their environments. That tune has changed.

However, on the other side of that is a slow realization that they *all* missed this. Yes, the biggest and best minds with their disruptive labs and crazy innovations... they missed this. None of them can lay claim to being a part of creating the newest entrant into what is arguably "their" space.

See if you can remember where you put your Magic 8 Ball (there is actually an app for that now), wipe the dust from it and gaze into the inky darkness. Proceed. Ask the Magic 8 Ball: "Magic 8 Ball, will Intelligent Automation remain a separate category of enterprise software?" Give it a shake. Turn it over.

What do you see? Is that an "Ask Again Later"? Wait, it seems to be "My reply is a ...". All fades to dark and then, it slowly rises to the surface and stabilizes. "Outlook Good"





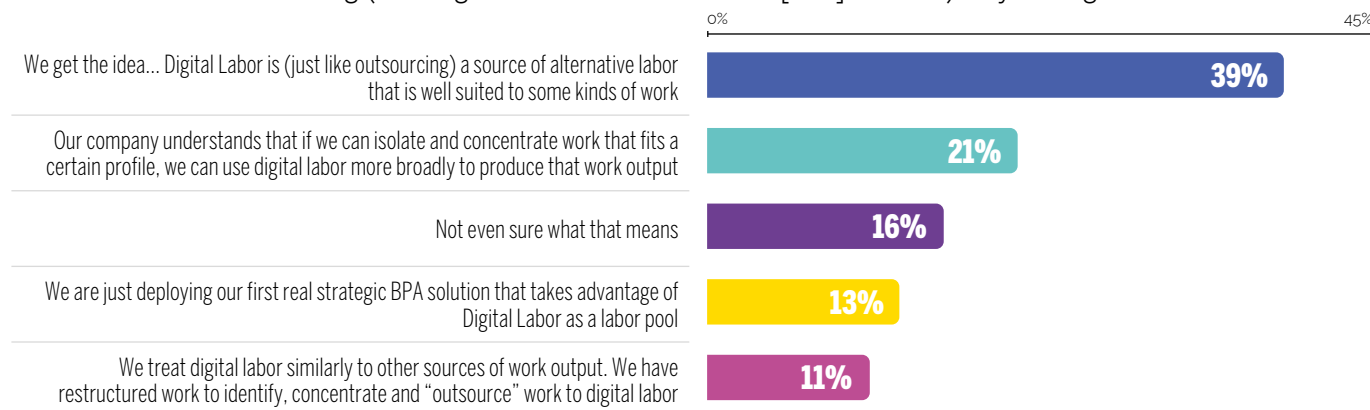
Author's Note

Lee Coulter

Chair, **IEEE Working Group on Standards in Intelligent Process Automation**

Optimizing process operations. This has been a driver for new enterprise operating models for decades. In the 90s, the hot new thing was offshoring. Technology suddenly made access to low-cost-location (LCL) skilled labor a reality. I have been active in the shared services and outsourcing industry for more than 20 years, and in automation since the term RPA was coined. There are good reasons RPA has had such a close affinity to offshoring. It seems that this is a growing trend. With IA and BPA, automation is capable of actually acting like a new source of labor. While this notion is new, almost 40% understand this important trend.

Does your company think about digital labor today the way that large enterprises considered outsourcing (sending work to a Low-Cost Labor [LCL] location) 25 years ago?



Source: SSON's Intelligent Automation Market Report Survey (Q4 2021)

- Technology advancements providing access to a new kind of labor
- Initial focus on predictable transaction work
- Early adopters typically strong in process management
- Efficiency (50-70% possible) and effectiveness improvement
- Lift and shift versus improve and transition
- The "work" (discover, document, implement, manage, improve)
- Change management
- Sales cycle (from provider PoV)
- Etc.

As a part of writing this, I spent time going back to look at data and publications (including my own). What struck me is how similar these two things are. I believe digital labor in 2021 is approximately the same as offshore labor in 1991. One possible exception; that of speed. Digital labor is advancing its capabilities year on year at an amazing pace. It is time for a mindset change. RPA and IA are not just novel technologies. They open the door to digital labor which will permanently change corporate operating models as surely as shared services and outsourcing did.

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NICE has been setting industry-wide standards in Robotic Process Automation for over 20 years. Our innovative Attended Automation solution, NEVA, brings people and robots together. It enables intelligent process optimization while unleashing employees' potential to ensure exceptional customer experiences.

NICE develops and manages the RPA portfolio (including unattended and attended bots, a task mining and desktop analytics solution) from a single platform, holds the largest scale automation projects in the market, and is known for driving digital transformation across the enterprise. nice.com/rpa

ABOUT NEWGEN



Newgen is the leading provider of a unified digital transformation platform with native process automation, content services, and communication management capabilities. Globally, successful enterprises rely on Newgen's industry-recognized low code application platform to develop and deploy complex, content-driven, and customer-engaging business applications on the cloud. From onboarding to service requests, lending to underwriting, and for many more use cases across industries. Newgen unlocks simple with speed and agility. www.newgensoft.com/company/

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The [Shared Services & Outsourcing Network \(SSON\)](#) is the largest and most established community of shared services and outsourcing professionals in the world, with over 180,000 members. Established in 1999, SSON recognised the revolution in support services as it was happening, and realised that a forum was needed through which practitioners could connect with each other on a regional and global basis. SSON is a one-stop shop for shared services professionals, offering industry-leading events, training and certification, market studies, reports, benchmarking, research and analytics, surveys, and more.

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