# THE NEW SCIENCE OF PROCESS AUTOMATION

(h[s]) HYPERSCIENCE®

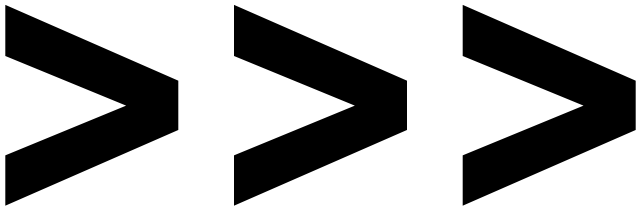
# MACHINE LEARNING GRADUATES

## AND GOES INTO BUSINESS

If you read the headlines, the Artificial Intelligence technique known as Machine Learning has graduated from winning at Jeopardy! to passing an eighth-grade science test. Less newsworthy but far more important are recent breakthroughs in Machine Learning that enable many organizations to automate tasks that previously required the judgement of humans. This revolution in process automation, using Machine Learning and related technologies like computer vision and speech recognition, is speeding up back office operations, reducing errors and improving customer experience.

These new approaches can also help organizations replace inflexible workflows and aging software stacks with technology that supports the kind of rapid innovation required to keep pace with an ever-changing marketplace.

We know that operations and tech veterans have heard this song before, and undoubtedly seen tech fads and unfulfilled promises galore. **That's where this guide comes in, helping skeptics and enthusiasts understand what's truly new in the world of automation and Machine Learning. You will also get guidance on how to design and implement a workflow incorporating both people and machines, which will help your organization improve operational performance today and position it to meet future challenges.**



# THE AI REVOLUTION:

## HOW MACHINE LEARNING HAS CHANGED AUTOMATION

## THE LIMITS OF ROBOTIC AUTOMATION

The best way to understand the new wave of Machine Learning-powered process automation is to show how it is different from previous attempts to wring efficiency from the back office. Robotic Process Automation (RPA), as an example, was developed to automate the simple, repetitive, well-defined steps that people follow while using software. RPA has been great at replicating human mouse clicks for simple tasks, such as dragging files into various folders or manipulating and updating data in a spreadsheet, and has mostly gotten it's input from strictly-controlled and limited input sources, such as plain-text emails and screen scraping. RPA is relatively simple to deploy, but it also has key limitations, including:

### [It's Rigid]

RPA was designed to execute precise rules. It can't handle variation or ambiguity, and if even one screen or menu changes in the core software, the bot can break or, worse, do untold damage that isn't discovered until it's too late.

### [It's Inflexible]

RPA, which automates a process at one point in time, binds your company even tighter to legacy systems, making innovation more difficult.

In order to continue adding value, RPA now needs to understand more inputs, read more documents, and raise its hands for human input and guidance - a challenge for many RPA solutions, especially as document and input types get more and more diverse and complex.

# MACHINE LEARNING CAN NOW HANDLE AMBIGUITY

In contrast to rules-based approaches, Machine Learning software builds its own model by training on real-world data and identifying patterns. Older approaches require human programmers to define rules in advance, but it's impossible to write enough code to cover all the possible scenarios that can come up in the real world.

*There's been explosive development in Machine Learning capabilities in recent years, and the technique has been particularly powerful in categorizing complex information and unstructured data because it sees the world in shades of gray rather than black and white.*

For example, Machine Learning can train on examples of emails and begin to identify which are spam and which are not, and apply that judgment to future emails.

- IS THIS EMAIL SPAM?
- IS THIS A PICTURE OF A CAT?
- IS THE CUSTOMER WHO SENT THIS MESSAGE ANGRY OR HAPPY?

# THE NEW PARADIGM: HUMANS IN-THE-LOOP

The other key hallmark of Machine Learning is that human feedback improves the initial model over time. Machine Learning software is deployed alongside with people, which can take one or more of the following forms:

- A human handles a task, with Machine Learning offering suggestions meant to save time or improve results.
- Tasks are routed to software, which only processes those about which the model is confident. Ambiguous cases are sent to a human for review.
- All tasks are processed by the Machine Learning system, but data from subsequent actions is used to improve the model with human oversight. Using the example above, Machine Learning models would come to watch every message that you mark as spam or rescue from the junk folder to discover new patterns and reduce the frequency of these errors in the future.

*For organizations, this can be a new - and challenging - way of thinking about how technology is deployed, how workflow is organized and how success is measured.*

# THE BENEFITS:

Here are some of the benefits Machine-Learning powered automation offers organizations:

## INCREASE EFFICIENCY

If you follow how information actually moves through your organization, you may be shocked to discover how often it slows for a detour into a manual process like text entry, routing, categorization, or verification. With Machine-Learning powered automation, you can streamline these processes and speed through former delays, and get a lot more done in a lot less time.

### According McKinsey research, intelligent automation can enable:

**50 -**

**70%**

**Reduction in Manual Tasks**

**20 -**

**35%**

**Reduction in Overall Costs**

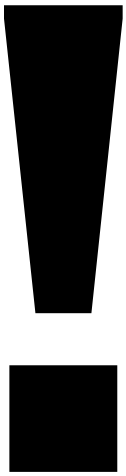
**50 -**

**60%**

**Reduction in Straight-Through Processing Times**

## REDUCE RISKS

Every hour that information is snaking through that byzantine process is another chance for something to go wrong. If a change order gets delayed, construction might start using the wrong plans. If an account number is mistranscribed, dunning notices might be sent to customers who have already paid their bills. Every small error and delay has the potential to create a large problem with customers and an expensive bill to fix the problem.



## IMPROVE CUSTOMER EXPERIENCE

Customers today are judging the companies they deal with based on their overall experience, not just product features and price.  If your legacy back office takes days or weeks to process a life insurance, car insurance or mortgage application, customers will opt for competitors with modern systems that can respond instantly. Machine Learning-powered process automation creates the infrastructure to deliver the service customers expect—fast, accurate, and personalized.

## EMPOWER EMPLOYEES

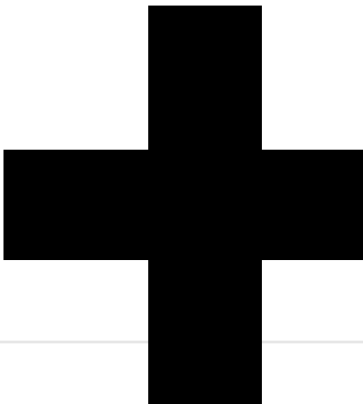
At some companies, Machine Learning-powered process automation may eliminate some jobs. But just as often, employees are freed from manual entry and able to concentrate on more complex situations. They increase their skills while serving the most valuable customers and driving their business forward.

## UNLOCK DATA

Many organizations today are failing to take advantage of the information they already possess because of the prohibitively high costs associated with processing and extracting data. Whereas a property claim may contain essential information that could be used to assess and price future policies, organizations are only capturing the "bare minimum" fields on a form to save time and money. Machine Learning-powered software allows more of that information to be extracted and categorized. This has the added benefit of increasing the return on expensive, business-critical applications that require accurate and complete data.

## PROMOTE INNOVATION

Machine Learning-powered process automation can cut through the thicket of overlapping systems that makes change difficult in many organizations. Rather than using approaches like RPA that lock-in past workflows, companies can streamline their operations and free up employee capacity to deliver innovative products and services that drive the business forward.



## CUT COSTS

Machine Learning-powered process automation lowers the direct, overhead costs associated with manual entry, as well as indirect costs such as hiring and training contractors to handle seasonal workflow peaks. It also helps reduce data errors at the source, as well as the downstream expenses associated with fixing them. It can take hours to work backwards and figure out why a payment posted to the wrong account or weeks to track down a customer and correct a wrong digit in a Social Security Number.

# THE PLAN:

## SETTING THE RIGHT GOALS

### FOCUS ON LONG-TERM RETURN RATHER THAN SHORT-TERM HEADLINES

Avoid the temptation to apply new technology in the most attention-grabbing way, and instead focus on core business processes that will benefit the most from automation. At most companies, the flow of information is the critical infrastructure, and eliminating manual bottlenecks at this source makes everything else run faster, more reliably, and more affordably. Getting the data right upstream enables greater application and analysis downstream.

### USE OPERATING METRICS THAT DEFINE BUSINESS EXCELLENCE

As with any new endeavor, you'll need to choose metrics to measure and communicate progress. With process automation projects, many organizations assume they should keep score by the percentage of manual processes automated. Experience shows, however, this can be a recipe for disaster.

*What good is 99% automation if 50% of the documents processed contain errors?*

Set goals that reflect that Machine Learning is based on a hybrid of people and machines that evolves over time. Defining success as an arbitrary level of automation undercuts this evolution and will likely cause an increase in errors as too much workflow is handled by a computer before the model is mature (or without the right human-in-the-loop checks in place).

The best measures of success focus your team and top management on the long-term impact of the project on the overall business. These could be **operating measures** (productivity or service delivery time), **customer impact** (churn rate or satisfaction scores) or **financial contribution** (impact on revenue or profits), but the point is to set reachable goals and optimize as you learn.

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# THE IMPLEMENTATION:

## SPECIFYING THE TECHNOLOGY

## DESIGN FOR FLEXIBILITY

As you integrate Machine Learning-based automation with your existing technology stack, configure it to improve existing processes today while paving the way for increased efficiency and innovation in the future. A key to such flexibility is being able to capture, annotate and store every bit of data in a way that can be accessed and interpreted by any other system at your organization. Evaluate software for how robust and flexible it is and how well it can integrate at the API level with other software in your stack.

Prioritize solutions - and vendors- that can be put to use today but also demonstrate a future vision and roadmap that will support tomorrow's needs.

## BUILD IN HUMAN INPUT WHERE NEEDED - AND ONLY WHERE NEEDED

As you begin implementing the technology, plot out which tasks will be routed to humans; getting the logic right for what can (and cannot) be automated is essential to achieving targets for accuracy at the lowest cost. Sometimes a whole class of transactions need human review, such as those involving high-dollar amounts or unusual circumstances.

In addition, the Machine Learning system should be programmed to ask for help if its confidence in a given task is below a certain threshold. There's no reason, however, to ask someone to check an entire form if just one field can't be read. Design the workflow to get human input only where it is needed.

To take full advantage of Machine Learning, it's also critical to identify any case in which the model's judgment is off, which means recording everything humans in that part of the hybrid process do. It can also mean connecting to downstream systems, so that if a letter is returned undeliverable or a customer calls in to fix a mistake, the Machine Learning model knows about it.

# THE WAY FORWARD

For technologists who have strived for years to balance the promise of new technology with the reality of running a complex, sprawling operation, these are exciting times. Advances in Machine Learning give companies a reliable path towards automating functions that have until now only been performed by people and fulfill promises made and broken many times before.

Most gratifying, however, is that companies no longer need to trade immediate benefit for long-term advantage. Intelligent processing solutions reduce risks and increase efficiencies, all while building infrastructure to power more innovative systems tomorrow.

If Intelligent Document Processing is something you've been wondering how to do – or if you see something you just plain don't believe is possible – let Hyperscience show you how. We've helped numerous organizations modernize their tech stacks and embrace the potential of automation.