New Technologies and Approaches Give Rise to Content Intelligence

Industry Insight Into How Content Intelligence Powers Robotic Processes

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Executive Overview

If you were starting a business today, you would build that business on the most innovative technologies of the day. Unfortunately, existing companies don't have that luxury and are often blindsided by rapid technological innovation.

They are hesitant to adopt new technologies for fear of disrupting their existing business – sort of a "if it isn't broke, don't fix it" attitude.

However, as new technologies change the way customers interact with companies, change becomes necessary for survival. For these companies, it is important to balance existing business practices with the introduction of new technological solutions. Institutional knowledge that may seem obsolete in a new technological landscape is critical to building new solutions – and the two must work together to bring long-established companies into the digital age.

If companies are to survive, they need to move into the digital age and address the ever-changing demands of their industry. To do so, they need to implement a mix of technologies to improve their processes and the way they engage with their customers. As technologies continue to evolve, they can provide businesses with previously unimagined ways to enhance the work environment, customer interactions, and the way they do business.

A key piece of digital transformation is the ability to bring together an intuitive understanding of content and automatically extract all relevant information from documents. Add to that Robotic Process Automation (RPA), a technology that automates business process activities by utilizing software robots that mimic the steps human employees take to accomplish a wide range of tasks. As the use of robotic automation increases, enterprises will expand the use of these digital workers to "intelligently" automate content centric processes involving images, documents, and text, to further enhance operations and create better customer experiences.

Working in concert with RPA is Artificial Intelligence (AI). AI is helping to learn from content and optimize performance. Its ability to understand and act on unstructured data is critically important to planning and achieving new levels of process efficiency and profit, as well as, aid in the development of new and innovative products and services.

Tech Savvy Customers Are Driving Digital Transformation

We are currently witnessing unprecedented change in the way companies do business. Innovative companies are finding new and imaginative ways to improve their business and customer interactions by employing transformative digital technologies.

This has left many companies striving to maintain their relevance in an ever-increasing competitive environment. Proof of this, according to Accenture CEO Pierre Nanterme, is that "Digital is the main reason just over half of the companies on the Fortune 500 have disappeared since the year 2000." Those companies ceased to exist because they didn't know how to use their content to improve their business processes and better serve their customers.

Today's consumers are digitally empowered through a proliferation of mobile devices and digital technologies. In response to this, several start-ups such as Quicken Loans, Airbnb, Uber and Lyft have created innovative business models to leverage digital technologies and revolutionize the industries they represent.

However, for established enterprises, it is not possible to start from scratch or easily transition to new technologies.

Replacing older legacy systems and processes can be extremely challenging requiring large IT investments and lengthy transitions. While many companies have invested in their existing infrastructure, they've done so piece-meal leading to a patchwork of systems and infrastructure that isn't very effective. For those companies, change is seemingly inextricable, and the adoption of new technologies is typically painful, costly and difficult.

Digital Transformation Requires New Thinking and New Strategies

It's a simple fact that digital transformation can be a complex undertaking, especially at the outset, where large buy-in and investment is needed. However, the tools and technologies to make new solutions a reality are readily available. In fact, the core technologies for digital transformation may already be in-use in certain areas of your organization. In most companies intelligent capture, Robotic Process Automation (RPA) and Artificial Intelligence (AI) are the central building blocks of digital transformation – allowing for a constellation of new solutions to rapidly transform your business.

Bold, tightly integrated digital strategies will be the biggest differentiator between companies that win and companies that don't, and the biggest payouts will go to those that initiate digital disruptions.

Source: "The Case for Digital Reinvention"
McKinsey Quarterly, February 2017.

A Unique Approach for Every Company

Digital transformation looks different from one organization to the next. Regardless of the details, the basics of digital transformation are the same. Transformation begins by applying new technologies to the processes a company has built – then building around its content to improve its processes through new applications and methods of doing business.

The most commonly used technologies behind digital transformation are intelligent capture, Robotic Process Automation (RPA), and Artificial Intelligence (AI). When working in concert, these technologies can automate a wide array of repetitive tasks along with the handling of both structured and unstructured content. By utilizing these technologies, you can connect legacy systems and other data sources to improve your processes. They allow your

processes to identify and understand your content, which is key to the success of any digital transformation initiative. It is especially critical to improving the "customer experience" by simplifying tasks like customer on-boarding, enrollment, online applications, interactive communications and other customer facing services.

Robotic process automation tools cut costs, eliminate keying errors, speed up processes and link applications.

Source: Gartner Market Guide for Robotic Process Automation Software, December, 2017

Robotic Process Automation – A Driving Force Behind Digital Transformation

The volume and complexity of content is growing exponentially. To leverage the value in that information, businesses need to do more than just scan and archive documents.

They need to automatically extract all relevant data and integrate that information into every aspect of their business.

Robotic Process Automation (RPA) is key to accomplishing this. RPA can boost productivity and efficiency by connecting to legacy systems and external data sources. It can be rapidly deployed and the bots are easy to configure – and once in place they perform work just like humans. Because of this, RPA is a fresh alternative to big IT projects that take months or even years to implement. It provides a quick Return on Investment (ROI) and provides an agile environment for businesses to reduce costs, meet compliance mandates and automate work in a wide variety of tasks.

Maximizing RPA's Potential by Automating Content Centric Processes

Robotic Process Automation does not use robotic arms or mechanical devices. It is sophisticated software designed to mimic what a user does in any application. It can connect legacy systems, apply business logic, and connect software and processes to eliminate the repetitive work that humans often perform. It works via software "robots" which follow a pre-determined process to automatically initiate actions, perform calculations, move or populate information be-tween pre-identified locations and/or launch downstream activities. By doing so, it helps organizations improve their processes, gain insight into their businesses and automate labor-intensive processes.

RPA can automate all or some stages of rule-based processes that were previously limited to manual intervention. Robots can leverage structured content from multiple data sources such as applications on mainframes, a web site, and desktop tools like Excel, and interpret that data in content intensive processes. RPA incorporates administrative and monitoring tools that assist administrators in the deployment and management of hundreds of robots, scaling up and down as more resources are needed – much like an organization would manage human resources. This new digital workforce of robots eliminates the manual repetitive work that in the past required human intervention and provides the foundation to expand beyond the initial set of process use cases.

To grow and expand the use of RPA within an enterprise, robots must become smarter to be able to interpret and understand unstructured content (documents, images, and text) and turn it into actionable structured information. Think of RPA as the starting point for intelligent automation where three digital classes are emerging and where different digital robots deliver varying degrees of intelligence.

Changing Business as We Know It

RPA is rapidly becoming the workhorse technology that is transforming business by automating tasks that once seemed out of reach due to cost, time, and lack of IT resources. Today, RPA robots can be quickly configured and deployed to automate the mundane and repetitive tasks that humans would traditionally be responsible for – such as extracting data from emails and copying and pasting data between multiple applications.

As adoption of RPA accelerates and the maturity of robotic automation increases, organizations will find more and more business processes that can utilize robots to improve content centric processes.

RPA is a promising new development in business automation that offers a potential ROI of 30–200 percent—in the first year.

Source: The next acronym you need to know about: RPA (Robotic Process Automation) McKinsey & Company, December, 2016

Rules
Robots used to extract and interpret existing applications for the purpose of automating rules-driven transactions.

Content Intelligence
Digitize, Searchable Content, Screen Scraping

Learning
Robots are able to understand unstructured content and apply it to process automation.

Content Intelligence
Digitize, Classify, Extract, Learn

Reasoning
Robots automate tasks involving intuition, judgement or problem solving. Mimics human intelligence and judgement.

Content Intelligence
Analyzing and understanding of text

Digital Class 1: Rules

Rules are "tried and true" automation tasks that can be found in every organization. An ideal automation candidate for this class involves well-defined activities that are organized in a repeatable sequence, deal with structured data, and include multiple systems requiring data entry or extraction.

Processes may require digitizing documents using OCR, and delivery of that content to a repository. This use of Rules is the easiest to implement and most widely adopted.

Digital Class 2: Learning

This class utilizes Learning to understand and process unstructured content. It makes RPA digital workers smarter, so they can automate a wider array of activities involving documents.

This type of automation can learn from experience using machine learning to classify and extract data from images, documents, and text – while automatically updating and improving processes to minimize human intervention.

Learning is a fast-growing class of RPA that requires the ability to classify and extract data from a wide range of documents while delivering high value to an enterprise.

Digital Class 3: Reasoning

Cognitive "robots" are subject matter experts – learning from your existing processes, data, and human decision making.

Reasoning combines advanced technologies such as natural language processing, artificial intelligence, machine learning, and content analytics to mimic human judgement and problem solving to determine things like intent (requested action), sentiment, and relationship between data. Reasoning is where forward-looking organizations are focusing their digital transformation.

Moving Beyond Traditional "Capture" with Content Intelligence

In the past, paper-based documents were essential to a functioning business. However, with the advent of scanners and mobile devices, organizations quickly realized that digitizing paper documents and data could improve their operations through more efficient processing, searching and storage.

Today, that scanning process known as "capture" is driving a shift in how organizations use and consume data. Capture has evolved to connect new digital technologies like Robotic Process Automation to handle invoicing, new account opening, claims processing and more. This evolution and how the technology is being consumed within the context of automation tools like RPA has led to enterprises using Content Intelligence to raise their Digital IQ.

Content Intelligence is defined as a class of enabling technologies that help digital workforces understand and create meaning from enterprise content. Content Intelligence provides the ability to automatically extract all relevant information from documents and breaks down processing of content into easy to use and consume technology that can be leveraged directly within an automation solution like RPA, targeting activities and skills required by the digital worker to solve specific business problems.

ABBYY Content Intelligence technology automatically identifies the content, extracts and validates the data, and delivers the results to the digital robot for processing.

Content Intelligence brings new meaning and opportunity for organizations to apply intelligence to their content and connect it to their business processes helping enterprises raise their Digital IQ. It brings several technologies together including OCR, Machine Learning, and other Artificial Intelligence technology to create structured information from unstructured content using the metadata within text, images, documents, and communications (e.g. email). The structure of the content and its data can then be easily connected to the robotic process and adapt to the many variations of a document.

Understanding the role of content in the enterprise is key to improving processes and user productivity. Since businesses receive their information through a variety of channels including mobile, scanners, fax, and email, it is important to turn that content into usable information that can be fed into processes and systems – regardless of its point of origin.

Next Phase of Automation: Adding Content Intelligence to RPA

When combined with RPA, Content Intelligence provides the cognitive skills required to assist in automating content-centric processes. Content Intelligence is changing the way we work by powering the new digital workforce with the skills and understanding needed to make intelligent business decisions. It helps organizations transform their operations, dramatically improve the customer experience, and significantly reduce operating costs. The use of technology that can understand and derive meaning from content can provide detailed insights into content which can then be used to better manage individual transactions, as well as, support formulating new business strategies for competitive advantage when implemented across millions of transactions.

Content Intelligence is helping transform business at all levels of RPA starting with the most basic automation robots all the way to designing robots that automate tasks involving more intuition, judgement, and problem solving.

RPA and AI are highly complementary technologies. When optimally combined enterprises can automate more of each process and more processes end-to-end. As an example, AI can read, parse, and classify the content of received documents. It can understand their meaning and sentiment, create actionable Content Intelligence and pass it on to RPA to do the resulting work.

Sarah Burnett, Vice President, Service Optimization Technologies

RPA	Content Intelligence Skills
Helps overcome system and process limitations	Provides understanding of content associated with the process
Non-invasively mimics users' activities	Mimics human thought process through vision, language, and pattern detection
Processes structured data from systems, spreadsheets, documents	Process structured, semi-structured, and unstructured content
Automation is rules based	Supervised learning of documents, and improves over time based on human input
Highly deterministic	Applies learning, but can also have safeguards built in that involve humans
General employee assisted digital worker	Highly skilled digital worker with understanding of content

All Types of Processes Can Benefit from Content Intelligence

Insurance

The opportunities for applying Content Intelligence are everywhere. For example, insurance companies can take in content as part of insurance claims where documents are identified, and data is extracted and turned into meaningful information and connected into a robotic process for analysis and processing.

Banking

Being able to understand content can also help banks deliver a seamless mobile customer experience as part of a lending process by capturing documents provided by the borrower – including pay stubs, utility bills, W-2, and other supporting documentation, be it structured or unstructured.

Transportation and Logistics

Logistics Content Intelligence can deliver a new set of digital workers with the right skills to identify and process shipping instructions, waybills, proof of delivery, and invoices associated with a load providing transparency and awareness of when goods are delivered and accelerating the billing process.

Cross Industry

Content Intelligence can also help all businesses in streamlining their accounting functions by automating and evaluating purchase orders, receipt of delivery documentation, payables, invoicing and receivables. This ability can save both corporations and government agencies both time and money when dealing with their back-office functions.

Content Intelligence Can Have a Measurable Impact on Your Business

Whether in the cloud or on premise, Content Intelligence can provide the ROI and agility you need to restructure business processes from the ground up. Its self-improving capabilities that can identify, understand, act and learn provide the following key functionality:

Diversity of Documents Handled

Content Intelligence allows you to handle multiple information types, structured and unstructured, including scanned documents images, digital documents (PDF), and email communications

Number of Languages, Text and Barcodes Handled

OCR technologies support 200 different languages, recognize machine printed text, hand printing, 1 and 2 dimensional barcodes, as well as checkmarks.

Automated Data Extraction

Automated data extraction from structured, semi-structured and unstructured documents allows you to eliminate error-prone manual keying.

Automated Processes Trigger Specific Robot Tasks

Once data is captured from a document, data can trigger specific tasks such as queuing for processing and the assignment of work based on workload, or skill-sets, including the suspension of processing when documents are missing.

Classification and Extraction Learns and Improves Over Time

Ensures that the document identification process can learn and improve overtime.

Enhanced Logic to Meet Business Rules

Automate the understanding of documents and transform that knowledge into actionable, electronic business information to meet business rules and procedures across lines of business.

Human Review and Exception Handling

If data is questionable or fails to pass a validation rule, built in verification allows for human exception handling providing a mix of human and automated decision making when required.

Integration With Mobile Devices

Take information from mobile devices and extract, validate and integrate that information in the same way you capture information from other sources to drive your business processes.

Enforced Compliance

Allows companies to trace and audit the acquisition of data and provides a compliance framework that ensures that each step in a business process meets regulatory requirements.

Operational Efficiency For Your Content Centric processes

Lower TCO and improve ROI by making Content Intelligence a natural extension of the way your company does business.

When to Automate Your Document Processes

Regardless of your industry or business process, Robotic Process Automation (RPA), Artificial Intelligence (AI) and Content Intelligence can automate any business process you may have – handling both structured and unstructured content. You are a candidate for these technologies if you find that you are:

- Dealing with outdated or complicated processes
- Manually entering data from documents
- Receiving documents from different channels such as mobile devices, the Internet, or other digital channels
- Manually classifying and routing documents as they enter your organization
- Having to sort and manually enter data from a document into a system
- Receiving content in different languages
- Facing competitive pressures and need to improve your customer service
- Worried about fraud and the security of your content
- Having to work with different processes, systems, and interfaces
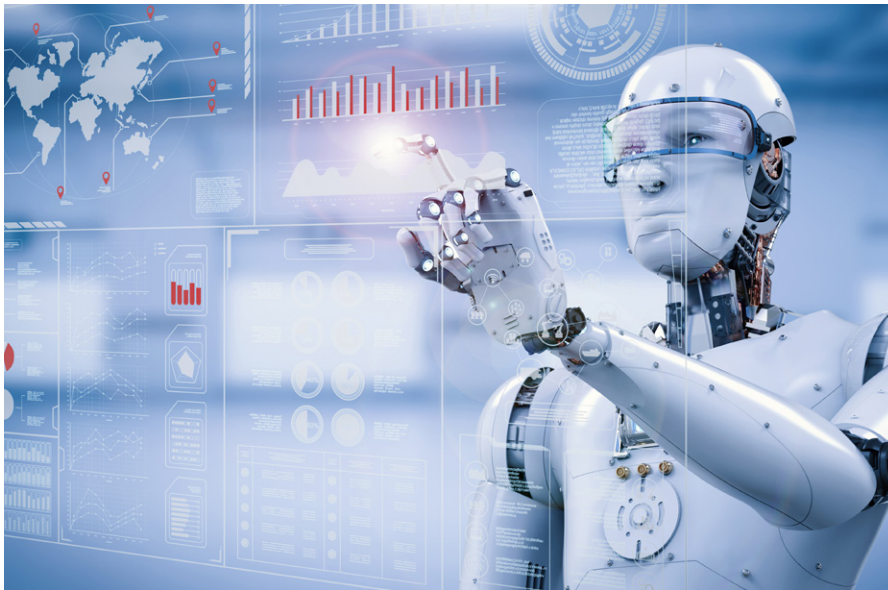- Trying to enforce regulatory compliance

Artificial Intelligence – Putting the Smarts in Content Intelligence

AI (Artificial Intelligence) has become a huge buzzword in today's business and can be a lot of different things to users and buyers of technology. Until now, most companies have been myopic when it comes to AI – not fully understanding the best way to use it.

In many cases organizations have failed to see AI's full potential and settled for only incremental improvements to traditional processes. To maximize AI's impact, organizations must understand how AI is applied to content and how when coupled with RPA it can create new, self-generating, self-optimizing processes that learn "as-they-go."

The big difference between RPA and AI technologies is RPA is focused on repetitive structured work while AI technologies are designed to understand unstructured content.

AI applies intuition, learned judgment and problem-solving pertaining to the process and content associated with it. RPA works with only structured data, which represents only a subset of processes that organizations are looking to automate.

AI is the underlying technology used to understand all kinds of content including; documents, images, text, and communications.

It encompasses Computer Vision Technology, Machine Learning (ML), and Natural Language Processing (NLP). By leveraging these technologies, AI can make processes more responsive and efficient. At the same time, RPA robots can further remove humans from the process. In addition, RPA can automatically predict and schedule processes and then apply AI to radically reconfigure those processes to be more responsive and productive. It is this capability that makes AI the perfect companion tool with RPA. Using the two in combination with Content Intelligence allows organizations to easily automate end-to-end processes and substantially increase the efficiency of their performance.

In the context of Content Intelligence, Artificial Intelligence synthesizes the content captured and applies real-time, work-level data, to generate more than just process statistics and operational analytics that measure the effectiveness of your business processes. It provides a means for process improvement that can act as a transformative agent to provide businesses and processes with previously unimagined ways to enhance the work environment, customer interactions, and the way today's companies do business.

AI technology – including Machine Learning (ML), Natural Language Processing (NLP) and computer vision – used in combination with RPA has the potential to unlock significantly greater business benefits than that achievable through standalone RPA.

The combination can help automate not just the transactional portions of processes but also the judgement-intensive ones.

Anil Vijayan, Practice Director, Service Optimization Technologies

Artificial Intelligence Definitions

Computer Vision: focused on the automatic extraction, analysis, and understanding of information from images, including scanned documents.

Machine Learning: refers to software that enables machines to "learn" in both a supervised and unsupervised way, improving accuracy and performance.

In a process involving capturing documents and processing with RPA, Machine Learning and other AI technology learns from potentially thousands of variations of documents such as processing invoices or handling vendor orders.

Natural Language Processing: The understanding of human language that enables software to read, interpret, and create structured data around unstructured content, such as emails and other communication messages.

Skill: A skill represents technology delivered as a service that provides the ability to carry out a task with determined results within a given amount of time, energy, and cost. An example of a cognitive skill would be classifying a document, extracting data, while using a cognitive learning service to improve overtime.

Conclusion

Revolutionizing the Way Work is Done.

To facilitate the confluence of Content Intelligence, Robotic Process Automation, and Artificial Intelligence, ABBYY has introduced ABBYY Vantage, a next generation Content Intelligence platform for the enterprise that provides the skills required to extract meaning from content by turning unstructured content into structured, actionable information. Vantage helps enterprises raise their Digital IQ by giving them the technologies and solutions to understand and process content.

Built with ABBYY Content Intelligence technology, ABBYY Vantage is revolutionizing the way we work by powering the new digital workforce with the skills and understanding needed to make intelligent business decisions. Vantage represents a transformative shift in the processing of content that utilizes skills to make digital robots in automation platforms smarter by leveraging OCR, Machine Learning and Artificial Intelligence in day-to-day business processes.

Vantage helps organizations accelerate their digital transformation by complementing intelligent automation platforms with new and advanced content skills to perform like humans. Vantage can be quickly and easily configured, deployed, and consumed throughout an enterprise to help organizations achieve their digital transformation goals in record time. It can significantly speed business processes to improve the customer experience and increases competitiveness.

When implemented with Robotic Process Automation (RPA) and/or Business Process Management (BPM) platforms, Vantage can provide enormous value for organizations that adopt it through improved productivity, lower costs, and the ability to create new ways of executing business processes.

Until now, most companies have taken a narrow view of how to achieve incremental improvements by focusing on automating repetitive tasks that don't deliver the performance expected. While automating repetitive business tasks may free up employees for more valuable work, true digital transformation needs to re-imagine business processes by leveraging Content Intelligence, Robotic Process Automation and Artificial Intelligence. The synergy created by Vantage is what will allow today's digital organizations to increase their process efficiency, provide better customer service and offer new and innovative products to their existing markets as well as those they have yet to penetrate.

In the digital world, "A skill represents technology delivered as an easy to consume service that enables a digital worker to carry out a cognitive task related to processing content with determined results valuable to the business, like extracting data from invoices or identifying and routing insurance claims documents to the right group."

Additional Resources

Digital Reinvention, McKinsey & Company, 2017

The Case for Digital Reinvention, McKinsey Quarterly, 2017

Look to Four Use Case Categories to Push RPA and AI Convergence, Forrester, August 2018

The Forrester Wave™: Robotic Process Automation, Q2 2018

Robotics and Cognitive Automation, KPMG, 2017

When and Where to Use Robotic Process Automation in Finance and Accounting, Gartner, February 2019

Gartner, **Market Guide for Robotic Process Automation Software,** December 2017

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