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Automating Content-Centric Processes with Artificial Intelligence (AI)

A New Era of Automation for Business Processes

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Introduction

AI, in different guises, such as Machine Learning (ML), Natural Language Processing (NLP), computer vision or voice recognition, working hand in hand with RPA, increases the scope and scale of process automation a great deal.

The advent of Robotic Process Automation (RPA) opened our eyes to how business processes could be automated, freeing people from mundane repetitive data processing tasks. Early adopters of RPA have been quick to realize benefits but as the maturity of their adoption increases, they are beginning to recognize that they need Artificial Intelligence (AI) automation as well. AI, in different guises, such as Machine Learning (ML), Natural Language Processing (NLP), computer vision or voice recognition, working hand in hand with RPA increases the scope and scale of process automation a great deal.

However, many still think of AI as a solution to a problem that is yet to be identified. That is simply not the case. Leading organizations, such as Amazon, Google, and major financial services institutions, have tapped into AI to improve their services, reduce costs, and prevent fraud and error.

In this paper, we examine:

- Applications of AI to business processes, in both the front- and the back -office
- How to get started on the AI automation journey
- A success story

This paper is intended for enterprise operations executives who are looking at increasing operational efficiency and are looking for the best approach to getting started on AI.

AI in content-centric business processes

One of the key differences between RPA and AI technologies is the type of data that they can process. RPA works with structured data while AI tools can process all types of data and, in particular, the unstructured variety, i.e. text, PDF, scanned documents, web content.

This capability has made them a focus for heavy content-centric processes that are typically handled in the front office, e.g. managing incoming customer emails. However, for customer-facing tasks the bar is usually very high, given the speed and accuracy that is needed to ensure a smooth customer journey.

Back-office processes often include unstructured content as well e.g. for identifying key data from various unstructured documents, such as scanned invoices and PDF files that come in many different layouts, for crosschecking financial information or writing letters to customers when their orders have been processed. These processes may benefit even more from such technologies, but have seen slower rates of AI adoption.

Exhibit 1, overleaf, summarizes the differences between RPA and AI.

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EXHIBIT 1

AI and RPA offer different automation

Source: Everest Group (2017)

Robotic Process Automation (RPA)	Artificial Intelligence (AI)
Mimics a user's activities – non-invasive	Mimics human thought process through vision, language, and pattern detection
Can process structured and some semi-structured data	Can process structured, semi-structured, and unstructured data
Rules-based automation	Can "learn" or change its behavior over time without being explicitly programmed, based on data collected
Highly deterministic	Probabilistic but can have safeguards to make it deterministic
Agent-assist or digital labor models	Point solutions – not broad-based capability (Narrow AI)

RPA helps overcome limitations of the landscape of existing systems, whereas AI works with those limitations to convert them into relevant output

It is the capability to automate content-centric processes that makes AI an ideal complementary technology to RPA. Using a combination of the two, organizations can automate processes end-to-end e.g. take in documents using AI, parse, classify, and understand meaning or sentiment and pass on the required action to RPA. Finish by composing an acknowledgement letter/text or email to the client using AI.

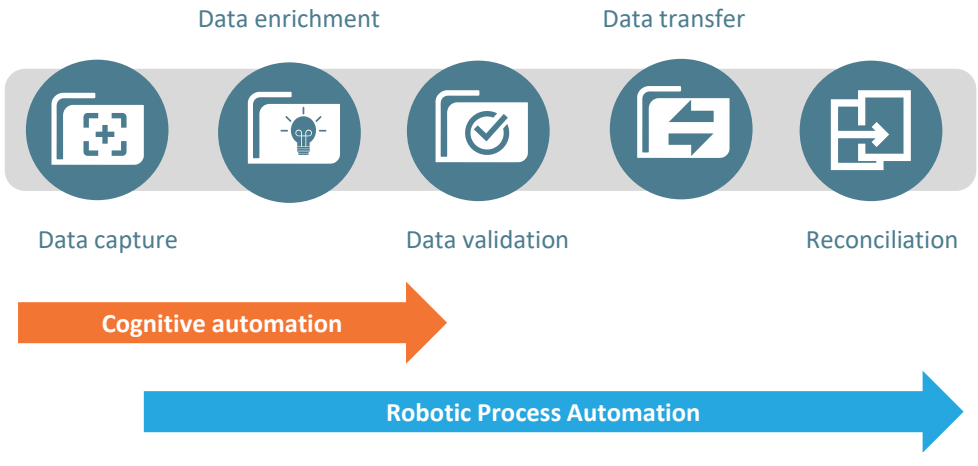
Exhibit 2 highlights this end-to-end process.

EXHIBIT 2

RPA and AI, combined together, can drive end-to-end process automation

Source: Everest Group (2017)

A typical end-to-end process involves both structured and unstructured data



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Artificial Intelligence (AI) technologies

AI is the ability of machines to exhibit human-like intelligence.

Definitions

AI is the ability of machines to exhibit human-like intelligence. With advances in technology, computational power, and machine learning techniques such as deep learning, significant progress has been made in the field of AI. We have been able to create systems that can simulate human-like capacities and even outperform human-expertise in specific domains or tasks such as playing board games, and answering trivia questions. Such expert systems are referred to as Narrow AI, as opposed to general AI, which seeks to perform any intellectual task that a human being can do. Currently, Narrow AI has shown business applicability, whereas general AI continues to be only a theoretical concept.
As such it is Narrow AI that is the focus of this paper.

- NLP is understanding the structure of sentences, their meaning and intention through statistical methods and machine learning. NLP converts text into data and vice versa and allows meaningful interactions between humans and computers. It includes natural language understanding and generation e.g. to compose meaningful text from data

- Computer vision is concerned with the automatic extraction, analysis, and understanding of useful information from a single image or a sequence of images, including scanned documents. It involves the development of theoretical and algorithmic basis to achieve automatic visual understanding

- ML refers to a set of algorithms that aims to enable machines to “learn” and improve their performance over time without being explicitly programmed, by passing large numbers of data points through the system

- Deep learning is a subfield of ML concerned with algorithms, inspired by the structure and function of the brain, based on artificial neural networks. It is an emerging field of technology that attempts to achieve breakthrough innovation in the field of AI

Applications of AI in the front office

AI is being increasingly used in the front office for different purposes:

- A combination of computer vision and NLP is used to read and understand the meaning of information in unstructured content, such as text, emails, letters, and images, to identify, classify, and structure the information into data for further processing. Use cases include handling incoming insurance claim forms and supplementary information such as photos, or collecting information in support of any application process such as a mortgage or a bank loan
- First line of support in the form of virtual agents and chat bots that handle client enquiries online. Use cases include handling IT or HR first line of support or answering questions from visitors to e-commerce websites e.g. holiday booking sites
- Best answer guides to users, be it customers or contact center agents, to find answers to their questions to speed up query resolution time. Use cases include helping users navigate repositories of information and knowledge bases to resolve issues faster, such as support enquiries in IT or discount and pricing information in online transactions

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Applications of AI in the back office

There are many applications of AI in the back office including:

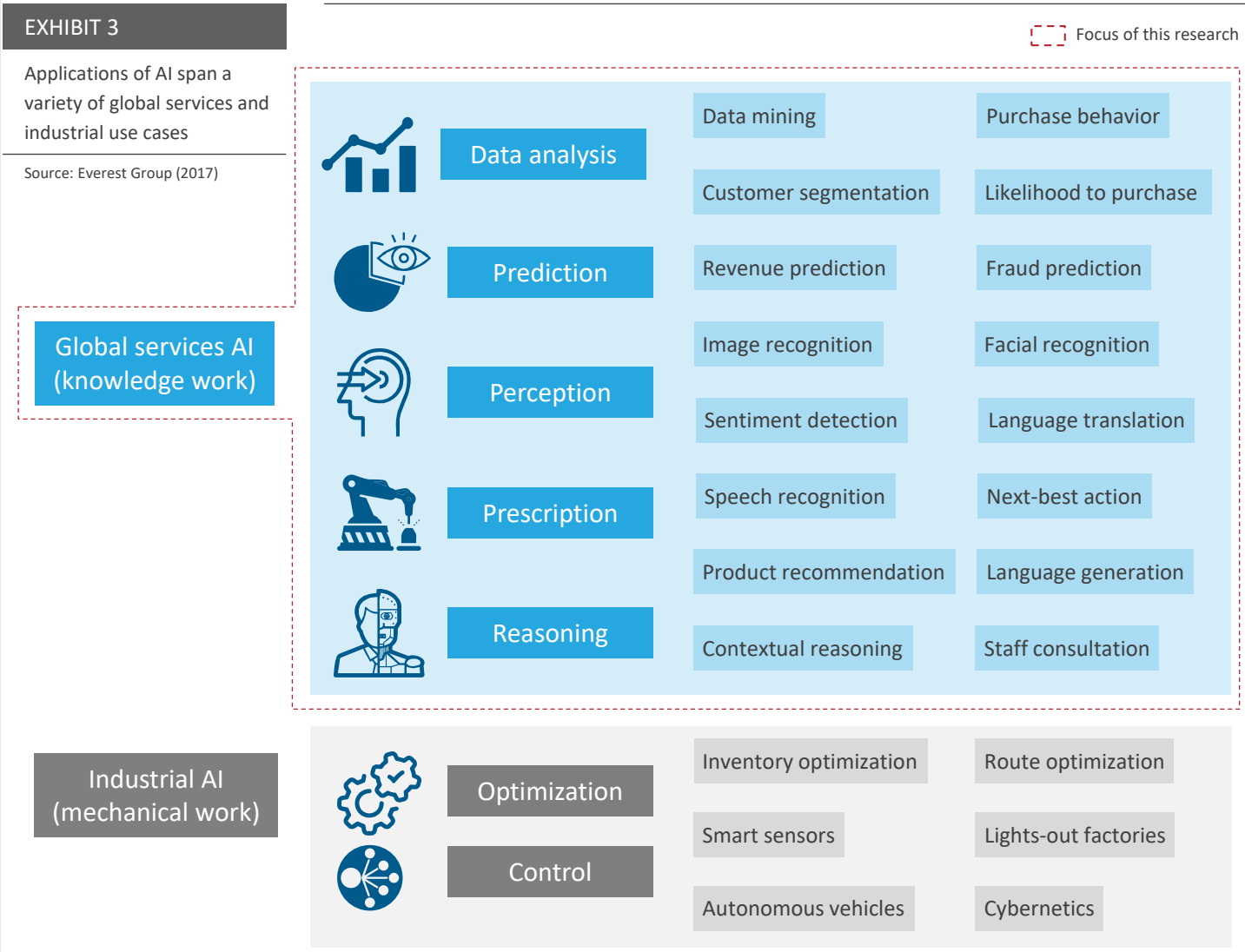
- Any process that includes both structured and unstructured data e.g. invoice processing that often requires scanning of documents and capture of data from the scanned images. Much of the data capture can be automated by using software based on AI technologies such as computer vision, ML, and NLP. This is more advanced than Optical Character Recognition (OCR) as AI can learn from its mistakes and become more efficient over time
- Loan servicing requires a great deal of cross referencing of data between forms and multitudes of supplementary documents to ensure data quality and accuracy, compliance with regulatory requirements, and fraud and error prevention
- Collecting information from thousands of documents, held on-premises or on the web, and identifying key data, e.g. company financial data from returns and announcements in the financial services industry and legal discovery processes

Exhibit 3 provides an overview of applications of AI in global and industrial services.

EXHIBIT 3

Applications of AI span a variety of global services and industrial use cases

Source: Everest Group (2017)



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How to get started

Given that many organizations have already used or are piloting RPA to automate the structured data part of their processes, it makes sense for them to start on AI by adding it to the content-centric part of the same processes.

Develop your skills

AI is still a relatively new technology and skills for adopting it are in very short supply. Many organizations are growing their AI skills organically through small scale projects and proofs of concept. Most organizations will have some technology savvy people that have spent time learning AI basics in their spare time. These could help get the organization started on the AI roadmap. Internal skills can always be topped up with resources from consultancies, System Integrators (SIs) or outsourcing service providers who may already be delivering some IT or business process services to the organization.

Start small

It is important to keep the first attempt at AI relatively small and focused on a specific requirement. When selecting the process to be automated, the organization should factor in that AI requires large volumes of training data for learning. Hence, AI is more suitable for automating content centric parts of highly repetitive processes.

Add AI to RPA

Given that many organizations have already used or are piloting RPA to automate the structured data part of their processes, it makes sense for them to start on AI by adding it to the content centric part of the same processes. The advantage of this approach is that the team will have already got the process redefined for automation and will have gained some experience. Those organizations that have not yet started their RPA journey should consider a roadmap that will combine RPA and AI, from the start, to transform their business processes and achieve higher business value from their investments.

Adopt a phased approach

The move towards AI could be done in phases with first a move from RPA to handle semi-structured data. This is typically data in documents, such as PDFs, that can be more easily identified and digested by machines.

The next phase could see the organization move to automate unstructured content e.g. the document in-take part of the process. This can be done by replacing a legacy OCR system with a smarter system based on computer vision, ML, and NLP.

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Technology investment

What to expect

Adoption of AI requires investment in technology that is more than just purchasing the software licenses.

Data

AI consumes and creates a lot of data and therefore, it is important for organizations to adopt a data strategy for the age of AI.

The questions to ask are:

- What data will the AI process and how does it access the data?
- Where will it put the data that it processes?
- How will that data be managed, maintained, and quality assured?
- Who will have access to the data and what security policy should apply to the role?

These are the key aspects of data governance that every organization should address in their corporate data strategy.

The data to consider include:

- Data for training the AI
- The unstructured data to be processed by AI
- The structured data generated by AI

Computing power and storage

Additional computing power, network capacity, and storage will be required for AI data crunching, saving, and archiving. This should be factored into the infrastructure plans and technology investment strategy of the organization.

Cloud, of course, offers the on-demand capacity that many organizations will require when using AI, e.g. for peak time processing or for both computing power and storage.

AI licensing options

Many AI vendors offer their solutions on a Software-as-a-Service (SaaS) only basis, with consumption-based pricing. Others offer both on-premise and on cloud options with annual licensing models. Most organizations should be able to find a model that best suits their requirements.

Other considerations when implementing AI

It is very important that organizations define a clear data management strategy for their AI deployment. This has already been addressed earlier in this paper. Additional computing capacity, network bandwidth, and storage are very likely to be needed. These too have already been mentioned above. To ensure ample computing resources for AI, organizations should consider it as part of the bigger enterprise architecture and capability assessment.

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Challenges include accuracy, scaling up from pilots, and getting the right skills into place for AI adoption.

In addition, organizations should consider:

- What data is to be used to train the AI? Many organizations get started by using legacy data from past transactions. Others train the AI by letting it watch and learn from the agents that are handling the process in the current live environment
- How are data privacy rules to be complied with? This affects how much of the data is processed and kept for archiving vs. anonymized and deleted after use

Challenges that organizations face when attempting to expand from a pilot include:

- Accuracy: In the beginning, users might find that AI's accuracy is low and this could result in a lack of trust in its output. AI learns by doing and the more it does the higher the accuracy gets. Organizations should factor this into the business case for AI and set stakeholder expectations accordingly. Failure to do so risks disillusionment early in the implementation cycle
- Scaling up from a pilot: Getting a measure of how many documents the AI can scan accurately or how many websites it can connect to and successfully extract information from
- Skills to achieve more outcomes: It is not just AI that learns by doing but humans too. The more the implementation team trials different types of AI, the more it learns how to take advantage of it

A success story

Business driver

An insurance claims representation company receives thousands of applications every day and deployed AI to automate some of its claims representation applications. Before AI was deployed, much of the processes were done manually by a team of 30 FTEs. The staff costs ran close to US$2 million annually. There were always resourcing issues around capacity at peak times.

The solution

The company deployed AI and RPA to automate processing of claims representation applications. The off-the-shelf AI solution reads incoming documents, classifies the information, and identifies key data before passing them on to RPA for automated processing.

Outcome

It is still early days but following automation, the company expects to reduce the personnel involved in this process to 14 FTEs, after deploying both AI and RPA. The expected reduction in headcount includes two FTEs that manage automation. Overall, staffing costs are expected to decrease by nearly US$1 million, freeing up 16 employees. These could create extra capacity in other processes or focus on higher value tasks.

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Conclusion

AI technology provides organizations with new opportunities for process efficiency and cost saving. There are already success stories emerging from the market that show encouraging results from the adoption of AI. In particular, there is a compelling case for using AI in processes where RPA has been implemented to automate unstructured parts of those processes. Given the complementary nature of these technologies, organizations can extend the scope and scale of their automation deployments and achieve higher value.

While skills for AI are rare, organizations can grow their own organically, boosted with services from SIs and service providers. The important thing is to get started and learn by doing more and more projects.

AI is here for organizations to take advantage of, to reach new highs in process efficiency, better services, and capacity to grow the top line. AI provides opportunities to offer new and innovative products and services as well.

Early adopters will not only lead in all-round AI skills but are set to gain a strong competitive edge as well.

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About Everest Group

Everest Group is a consulting and research firm focused on strategic IT, business services, and sourcing. We are trusted advisors to senior executives of leading enterprises, providers, and investors. Our firm helps clients improve operational and financial performance through a hands-on process that supports them in making well-informed decisions that deliver high-impact results and achieve sustained value. Our insight and guidance empower clients to improve organizational efficiency, effectiveness, agility, and responsiveness. What sets Everest Group apart is the integration of deep sourcing knowledge, problem-solving skills and original research. Details and in-depth content are available at www.everestgrp.com.

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