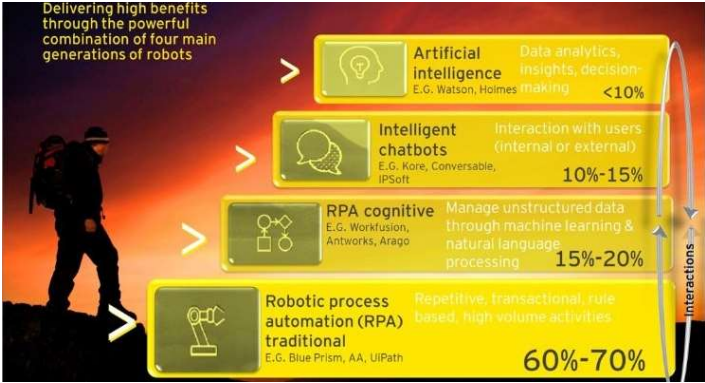




Intelligent automation is about creating synergies between RPA, cognitive, chatbots and AI



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As digital technologies and concepts evolve at a very rapid pace, we are hearing company leaders raise the following questions:

- *What are the next steps after Robotic Process Automation (RPA)?*
- *How Artificial Intelligence (AI), chatbots and RPA are linked together, which one brings value to the other?*
- *We have already implemented some chatbots, do we really need to implement RPA?*
- *Our competitors are already using AI. Should we be doing the same? Are we late?*
- *Where should we start our intelligent automation journey? How can we get prepared for the next steps in*

this journey, and make sure we build this journey in a sustainable and consistent manner?

To try providing anchor points to answer these questions, my colleagues and I have built a simple and **very useful framework**. In this article, we will describe this framework and provide the keys to understand it. In our next article, we will explain how to use it by providing use cases, and explaining how to build a successful strategy and implementation approach.

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Summary:

- *Companies are going through the intelligent automation journey (or digital operations journey) by digitalizing their process activities using robots. Their goals are mainly to improve business efficiency, reduce costs, enhance customer experience (internal and external clients), and reach a higher level of process excellence (e.g., improve quality, accuracy).*
- *The "intelligent automation journey" framework, illustrated in the image above, describes the four main generations of robots that companies are implementing, their characteristics and associated benefits.*
- *It seems more logical to deploy the robot generations in a sequential order, starting from generation one to four (e.g., implementing traditional RPA before implementing*

the next ones). In doing so, companies will be able to avoid experiencing the “empty shell effect.”

- *Above all, to create a maximum of value out of this journey, effective interactions between the generations of robots need to be implemented. New generations are not meant to replace existing ones, but instead, they are to work hand-in-hand. We have identified that these interactions create synergies, where each generation will add value beyond its single intended benefit.*

A. THE INTELLIGENT AUTOMATION JOURNEY

Building on the “future of RPA” as described in my [previous article](#), below are the descriptions of the different generations of robots presented in this framework:

The **traditional RPA** generation includes robots which can perform transactional, repetitive, rule-based actions in a digitalized environment (“dumb robots”). On the basis of our experience, this is applicable to the largest part of the automated process activities in a company (more than 60%). Benefits delivered are large in terms of cost savings, improvement of user experience, quality and accuracy. The limits of RPA lie in the absence of capacity to manage unstructured data, to interact using natural language and to handle judgment activities. Still for the next 10 years, due to the large volume, we expect this generation of robots will remain the key focus of companies.

Cognitive RPA widens the application of RPA to process activities using unstructured data, which we estimate at 15% to 20% of the automated processes in a company. Cognitive RPA delivers similar benefits to traditional RPA, but unlocks the capacity for the robot to manage unstructured data, such as free text messages (e.g., emails), or scanned images (e.g., invoices, or people IDs). Adding the functions of natural language processing (NLP) to a traditional RPA robot enables it to understand a free flow of sentences. Machine learning allows the robot to identify and learn patterns, contexts, through repetitive exposure to a series of inputs and outputs (e.g., P.O means “purchase

order" when presented on an invoice, but can mean "post office" in the context of an address).

The **intelligent chatbots** enable interaction with users (e.g., internal or external customers). Their benefits are mainly qualitative, focusing on customer experience improvement. Chatbots are using several communication channels such as messaging (e.g., Slack, Facebook), SMS or text or voice-based assistants (e.g., Siri, Alexa). There are two key types of chatbots, one powered by a set of rules, and the other powered by machine learning. In this framework, we only refer to the second one, which we call "intelligent chatbots." By using machine learning, chatbots can learn from conversations and actually improve over time. In this framework, intelligent chatbots act mainly as the interface between humans and other generations of robots.

Artificial intelligence is the capacity for robots to mimic human intelligence. We expect that AI robots will be able to autonomously manage the earlier generations of robots. Non-routine cognitive work, which involves interaction with humans and complex, ambiguous reference materials, presents the most valuable target for AI. Those processes are estimated to represent less than 10% of the volume of automated process activities of a company, but they would deliver the highest value of all the generations of robots. These applications can become force-multipliers for the most valuable work that employees perform. However, from our point of view, we are not there yet and we need to separate science from fiction. We are in early days of creating systems in which the training of mission-critical AI applications is done routinely. Translating important domain knowledge from human experts to these systems requires significant investment. The few applications of AI that we see currently are represented by robots like Watson, AlphaGo or Holmes, which all have very focused fields of application (e.g., diagnosis of breast cancer in some hospitals or focused legal research).

B. FROM ONE GENERATION OF ROBOTS TO THE NEXT

Intelligent automation is a journey, not a destination. In this framework, all generations of robots have one thing in common: they deliver benefits to all companies across industries and functions. Meanwhile, as we climb the generations of robots **from traditional RPA to AI, we can observe the following progression in characteristics:**

- Costs and time to implement are higher.
- Theoretical volume of processes it can be applied to are lower.
- There is more room for the technology to improve in the future.
- The application of the robots is more specialized and niche.
- Benefits delivered by the robots are more qualitative and non-financial.
- Robot's functionalities are more sophisticated and intelligent.

Hence, **there is a logic behind adopting lower generations of robots before moving to implement higher ones.**

In addition, on the basis of our experience, **starting with RPA (traditional and cognitive) creates a useful foundation** to kick off the journey because:

- RPA is an accessible, well-proven technology, easy and fast to implement.
- RPA allows attractive financial business case and high return on investments (due to volume of process activities, and accessibility of the technology).
- RPA kick-starts the journey with tangible benefits for the company, including monetary savings. These savings can be used to finance the next generations of robots, or for the creation of a digital center of excellence which will drive the company throughout the intelligent automation journey.

Nevertheless, we don't foresee any major issue if companies were to adopt the generations in a different sequence (e.g., start with adopting intelligent chatbots before going through RPA):

- The most important point is to **kick off the intelligent automation journey as soon as possible**, to start amassing benefits and experience before competitors, in order to gain a competitive advantage and increase market share.
- The most critical success factor to consider and anticipate is the interactions between the generations of robots, in order to maximize the benefits of the journey.

C. INTERACTIONS BETWEEN THE GENERATIONS OF ROBOTS

The evolution presented in this framework is cumulative. Moving from one generation of robots to the next, you add to the current generation the benefits of the next one. So, theoretically, towards the end of the journey, companies host all types of robots ranging from traditional RPA to AI. **To create a maximum of value out of this journey, effective interactions between the generations of robots need to be implemented.**

For example, if intelligent chatbots are not connected with RPA, although chatbots create intelligent conversations with human, they are not able to deliver more than pure raw information (e. g., the price of a stock, or the temperature currently in London). **We call this the “empty shell effect.”**

Let us take a look at a concrete illustration of **interaction between intelligent chatbot and RPA**. During a conversation, intelligent chatbot understands that a finance manager needs some clarity on the evolution of the margins of one of its business divisions. Hence, chatbot asks the finance manager whether he wants to receive the usual margin analysis report. The finance manager confirms. The chatbot triggers RPA, which produces the report computing information from different systems, and delivers to the chatbot. The chatbot then provides the requested report to the finance manager. After analyzing the report, the manager communicates to chatbot its decision to buy more of a product inventory. Chatbot will

interact with RPA which will execute the action by preparing and posting an order to the supplier. This example demonstrates a powerful synergy where chatbots improve the link between the humans and the RPA platform, while RPA enriches the content and the reach of the chatbots' interactions with humans.

Another illustration of **interaction is between AI and RPA**. In the decision making process, AI, which is powered by data analytics, requires a large amount of data, in order to enable formulating the insights which will be used for decision-making. RPA will bring an important support by collecting data across different systems, by cleaning, computing, and preparing it to be ready for treatment by AI. And then, when the decision has been taken, AI will be able to rely on RPA to execute it (e. g., perform a bank account transfer).

Traditional RPA and cognitive RPA. An example of interactions is often seen in the case of companies which are still using a lot of paper-based information. Cognitive RPA will be able to intelligently digitalize their millions of pages of unstructured data. When digitalized, the information can be used as an input for traditional RPA (e.g., to read and understand invoices, before traditional RPA uses it to perform entries into the accounting system) or intelligent chatbots (e.g., use the information in intelligent conversations with users).

Please share your thoughts and views, leave a comment.

I would like to thank the key contributors to this article: [Weston Jones](#), [Martin Weis](#) and [David Ashton](#) (co-authors), Keith Strier, Muni Vinay Kamisetty, Jemma Bingham and Anand Kumar.

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Note: The views reflected in this article are the views of the authors and do not necessarily reflect the views of the global EY organization or its member firms.

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5y ...

Thanks. Very useful analysis in this new and scattered field. I almost laugh for '...we need to separate science from fiction...' 😊 some of my clients asked for IA while it's RPA-able.

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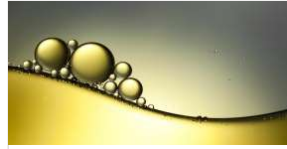
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