



Embracing the cognitive era

**Using automation to break
transformation barriers – and make
every employee an innovator**

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Introduction

Steve Jobs said innovation is the difference between leaders and followers. Indeed, in today's fast-moving environment, innovation drives economic growth and competitive advantage. That is why most business leaders see it as one of their top three priorities.

But the business of innovation is hard, and the biggest spenders are not always the most successful. In fact, in a global innovation study, only 25 percent of enterprises were effectively generating new ideas and turning them into market success,¹ due largely to a lack of time, capital, and talent.

Companies have tried various strategies to overcome these constraints. Google, for example, encouraged employees to dedicate 20 percent of their time to experimenting with their own ideas.² IBM has flirted on and off with "Think Fridays," reserving a weekly afternoon for employees to literally just think.³ At KPMG we are creating innovation labs with top-notch talent, an exclusive focus on innovation, and guaranteed access to capital.

But why should such innovation be restricted only to a select group of employees or a certain slot of time? What if every employee had all the time and resources that he or she needs to be an innovator? What if you could transform your enterprise into an engine of unconstrained innovation?

¹Booz & Company, *The 2012 Global Innovation 1000*

²The Google Way: Give Engineers Room, *New York Times*, October 21, 2007

³IBM Think Fridays: Time to become innovative, *Big Think*, 2007

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The answer: cognitive automation

"We are at an inflection point in the way that humans relate to technology. This will be as impactful to the workforce as mechanical enablement was to workers in the Industrial Revolution. We may see history record this exciting window of change as the Cognitive Revolution."

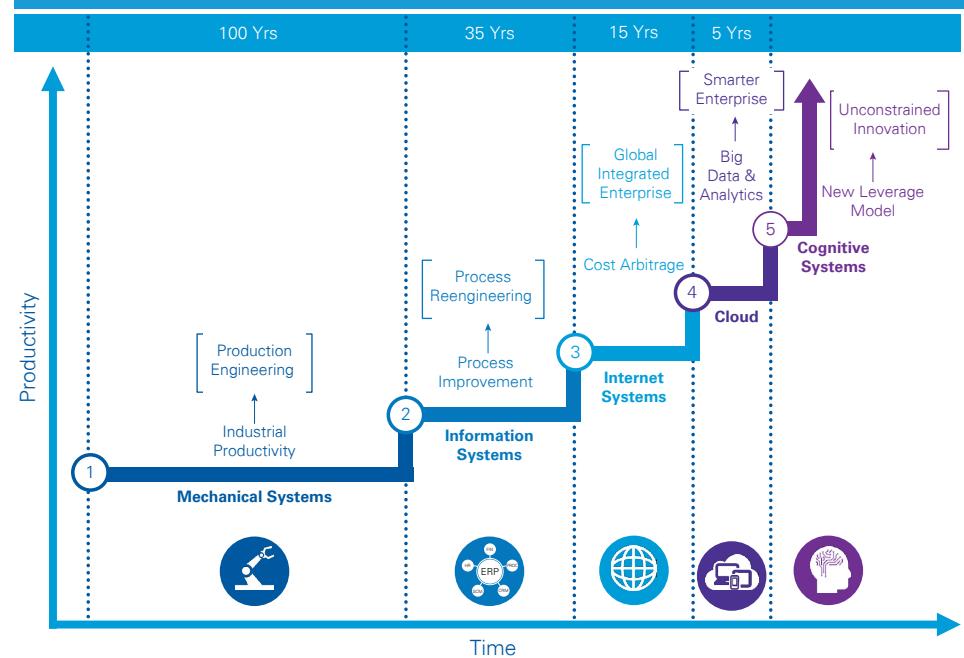
Steve Hill, Global Head, Innovation & Investments, KPMG

The cognitive systems era, which is the most exciting phase of enterprise transformation in more than a century, is upon us. Cognitive software mimics human activities such as perceiving, inferring, gathering evidence, making hypotheses, and reasoning. And when combined with advanced automation, these systems can be trained to execute judgment-intensive tasks.

As such, cognitive automation is creating a new class of digital workers that can enhance human skills and expertise, making every employee an innovator. And instead of innovating just on Fridays or with 20 percent of their time, employees will innovate all the time, transforming the enterprise into an engine of innovation.

How we got here – and the next wave of business transformation

The modern enterprise, born in the late 19th and early 20th centuries, operates at the intersection of people and process. Historically, technology has been a consistent catalyst for enterprise transformation.





Mechanical Systems

The mechanical systems era spawned machines that could augment human workers by mimicking human musculoskeletal functions. The assembly line was born, as business leaders sought to improve industrial productivity.



Information Systems

Beginning in the late 1950s and early 1960s, companies created information systems to codify critical business processes and automate common tasks. Through the late 1990s, leaders focused on improving productivity by reengineering business processes – with the help of enterprise resource planning, supply chain management, and customer relationship management.



Internet Systems

By the early 2000s, as enterprise productivity plateaued, business leaders seized on the opportunity for workforce cost arbitrage in emerging markets.

Organisations became globally integrated, using shared services, outsourcing, and offshoring to shift previously codified business processes to geographically scattered, low-cost workforce pools—all connected by the Internet.



Cloud & the Internet of Things

In recent years, enterprises have leveraged the long tail of the Internet era to become smarter and more connected—through social, mobile, analytics, and cloud.



Cognitive Systems

Today, the advent of cognitive automation is the most exciting phase of enterprise transformation in more than a century. Cognitive systems are poised to bring new, unprecedented levels of automation and productivity to functions throughout the enterprise, including those traditionally driven by human judgment and experience.

By 2020, smart machines will be a top five investment priority for more than 30% of CIOs.

Gartner Predicts 2016: Smart Machines: <https://www.gartner.com/doc/3175120/predicts-smart-machines>

Cognitive automation is a new strategy for transformation. It puts unconstrained innovation well within reach by:

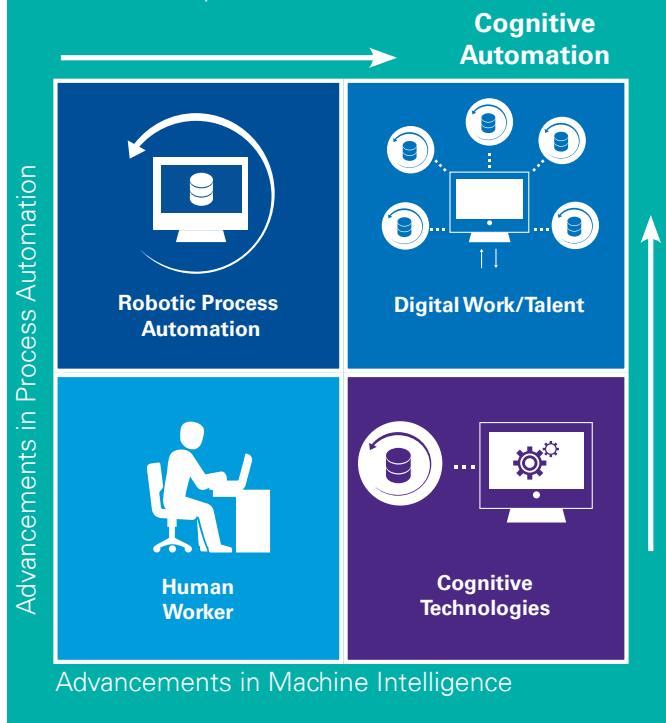
Augmenting human skills, enabling employees to contribute new insights.

With cognitive software at their side, generalists can behave like specialists, and less experienced employees can perform like seasoned veterans. For example, a young tax accountant who once may have struggled to interpret a general ledger can now use a cognitive system to instantly analyze enterprise transactions, and effortlessly translate GAAP accounts (prepared with generally accepted accounting principles) into tax accounts. Moreover, this accountant can simultaneously learn why certain line items are treated the way they are.

A physician, meanwhile, can use a cognitive system to read a patient's medical records and uncover innovative treatment protocols by researching a vast, constantly evolving body of knowledge.

A new class of digital workers

Cognitive automation is the convergence of robotic process automation (RPA) and cognitive technologies. These cognitive systems – including natural language processing, machine learning, data analytics, and probabilistic reasoning – can perform tasks that have historically required human intelligence and situational analysis.



Digital workers help employees tackle unfamiliar professional situations, and contribute new insights to the enterprise. For example, a paralegal who traditionally used, say, LexisNexis to identify legal precedent is no longer limited by the size of the knowledge base or the time required to search, analyse, and synthesise the findings into a compelling rationale. Instead, by using cognitive software to analyse massive amounts of structured and unstructured data, he or she can now research everything in a short period – and suggest new ideas that the legal team previously had not considered. In this way, cognitive automation helps employees evolve quickly from casual experts to professionals with deep skills.

Similarly, an auditor can use a cognitive system to significantly improve his or her analysis of a company's books. Instead of reviewing just the past 10 years, he or she can review the past 100 years – and potentially uncover new correlations and historical anomalies that could point to previously unknown risks. In short, cognitive systems can significantly help professionals solve routine and unfamiliar problems, so they can discover new insights and innovative ways to do their jobs. And this discovery will not be relegated to one afternoon a week; it will potentially be in every minute of their professional life.

A different kind of leverage model

Cognitive automation is poised to remove constraints on people, time, and capital throughout the enterprise:

Casual expert → Skilled expert	Accelerate time to employee proficiency
Inexperienced employee → Seasoned veteran	
Speed and responsiveness	
Value through new insights	Augment decisions in the moment
Reduced risk	
Consistency of output	
Pursuit of adjacencies	Scale expertise within the enterprise
Revenue growth – without the proportional growth in headcount	

Overcoming the barriers to innovation

When it comes to innovation, most Organisations face hurdles related to talent, capital, and time. Cognitive automation is a way to surmount them.

Accelerating time to proficiency.

With the help of digital workers, new employees – both untrained and professional – can quickly assimilate into the enterprise culture and begin delivering on key performance indicators. In a call center, for example, a new agent may typically spend considerable time training in knowledge bases and other systems before taking a call in a live customer support environment. But by using cognitive software – in the form of a digital assistant – a relatively inexperienced agent can become proficient much more quickly, answering questions that typically would be fielded by more seasoned veterans. As baby boomers leave the workforce and millennials enter it, companies can use cognitive assistants to bridge the expertise gap.

Scaling expertise across the enterprise.

An enterprise is a function of talent and expertise across the ranks. That is why companies spend billions each year to acquire the right employees, identify the best performers, codify their characteristics, and diffuse them throughout the organization – so all employees can function like the best employees. With cognitive systems, this process of scaling expertise becomes much easier. Cognitive systems can observe and learn from top performers – and quickly transfer those learnings to other employees. Cognitive systems can be trained on the basis of the top performers, and then used to assist and augment other employees in a digital assistant mode.

So whether you are looking at the back office, middle office, or front office, cognitive systems can help you overcome the traditional barriers of time, capital, and talent to scale expertise across the enterprise. These systems can also improve the quality and consistency of output.

One of the most profound examples is in the healthcare industry. Leading medical institutions such as Memorial Sloan Kettering are using cognitive systems to quickly scale medical expertise to distant markets such as the Middle East and Asia, where local doctors may not have the same knowledge or training as their U.S. counterparts. These local doctors are being assisted by specialist trained cognitive systems when they diagnose and treat patients, bringing advanced diagnosis and treatment assistance in the form of cognitive assistants. Thanks to this innovation, these institutions are providing overseas patients with high-quality healthcare, previously unavailable in these markets.

Ultimately, the cognitive era will likely unleash transformative enterprise growth through unconstrained innovation, so you can reduce risk, respond more quickly to market demands, and pursue adjacent opportunities.

Skills and talent gaps

Issue: Due to a lack of skills, training, and knowledge, many workforces are not capable of driving innovation effectively.

Solution: Digital workers augment human intelligence to make employees more knowledgeable and productive.

Example: A machine analyses massive amounts of cancer research in the time it would take a human to analyze a single study.

Capital gaps

Issue: Amid competing priorities, valuable resources are often devoted to immediate needs, and not to higher-level, innovative pursuits.

Solution: Digital workers help human workers complete mundane, routine, lower-level tasks more efficiently, so they can add value through innovation.

Example: A top U.S. bank used RPA to resolve more than half of its information-technology-related incidents without human intervention*, freeing up IT staff to work on business-advancing initiatives.

Time gaps

Issue: Many enterprises innovate too slowly to seize emerging opportunities and separate themselves from competitors.

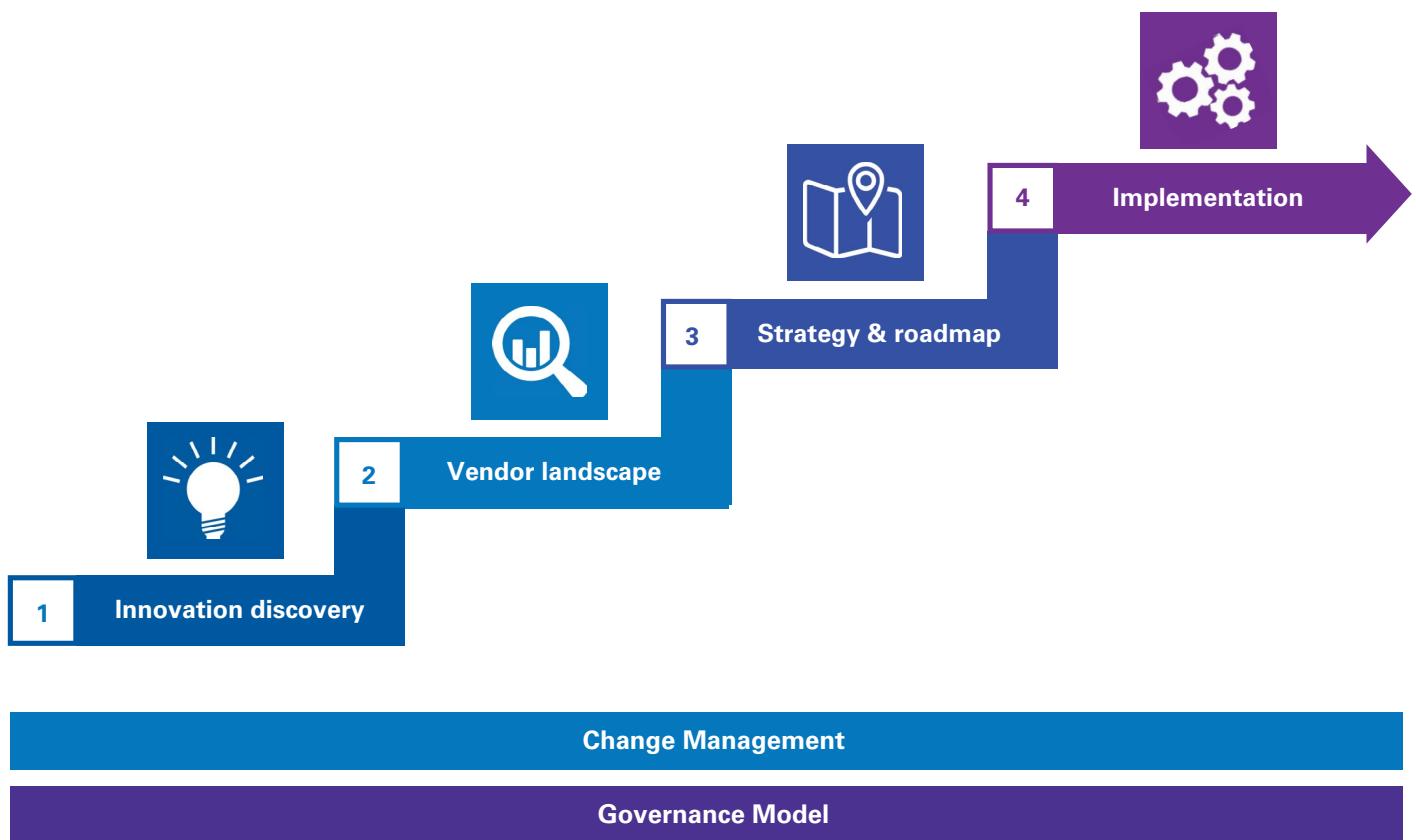
Solution: Digital workers enable employees to devote more of their time to creative, high-value work that increases company agility.

Example: A finance professional who previously spent half his workday processing transactions now has time to evaluate new cost-saving opportunities for the firm.

*How Digital Labor Is Transforming IT, CIO Insight, 2014

How to get started with cognitive automation

Innovation leaders see cognitive automation not just as technology implementation, but part of a holistic strategy that reaches across the enterprise, potentially improving the performance of every employee. Want to harness digital workers for enterprise innovation? Consider these four phases:



1 Innovation discovery

With your industry leadership at stake, it is critical to navigate the complexities of cognitive automation and evaluate its potential in your enterprise – and do so quickly. To start and sustain the cognitive automation journey, determine what the disruptive trend will mean for your business processes, people, and culture. What are the benefits of digital workers? What are the cognitive opportunities across functions? How will employees do their jobs differently? Your innovation discovery should culminate in a clear understanding of these factors, so you can prepare the organisation for significant transformation.

2 Vendor landscape

Cognitive automation vendors have varying levels of maturity and capability, so it is important to separate hype from reality and choose the right solution for your needs. Do you need a niche software provider with narrow applications, such as digital assistants for retail customer service? Do you need a vendor for configurable process robotics software? Or is it best to seek a provider of more comprehensive platforms in artificial intelligence and machine learning?

Ultimately, vendor selection should align with your strategy for creating enterprise value, balancing short-term quick wins with long-term game changers. Also consider how vendors will complement your internal capabilities.

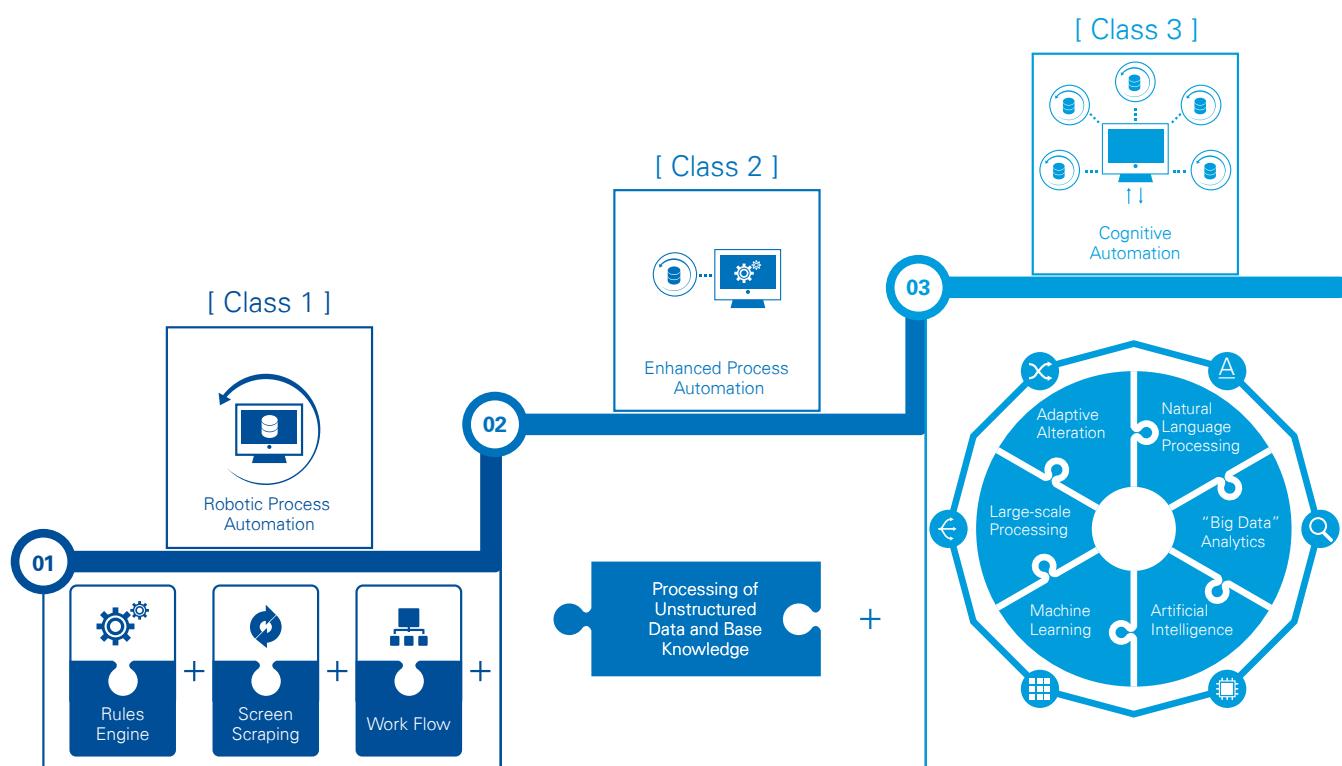
3 Strategy and roadmap

To help ensure success in the cognitive automation journey, determine where to start and how to progress. Your strategy and roadmap should include prioritised use cases, along with “cognitive moments” that represent transformative opportunities, plus quantified benefits, a high-level solution architecture, and user personas to show how employees will be impacted by digital workers. This kind of approach will serve as a blueprint for execution.

4 Implementation

Use a portfolio approach to reduce the risk of your cognitive transformation, while ensuring that the enterprise can extract value from implementations both simple and complex. For example, you might want to start with simple RPA for quick value (refer to the different classes of automation below), which in turn can support more complex cognitive projects. Cognitive projects take longer to implement but, accordingly, have a higher business impact. Finally, ensure that technology teams use modern design thinking and agile methodologies to drive user adoption at every stage of the implementation roadmap.

Just as critical to sustained success is a model for change management and governance, which should have the full commitment of leadership and underpin all four phases of the transformation journey. This model helps ensure that the cognitive automation vision – to transform the enterprise into an engine of unconstrained innovation – becomes a reality, with buy-in from all parts of the organisation.



Where do you go from here?

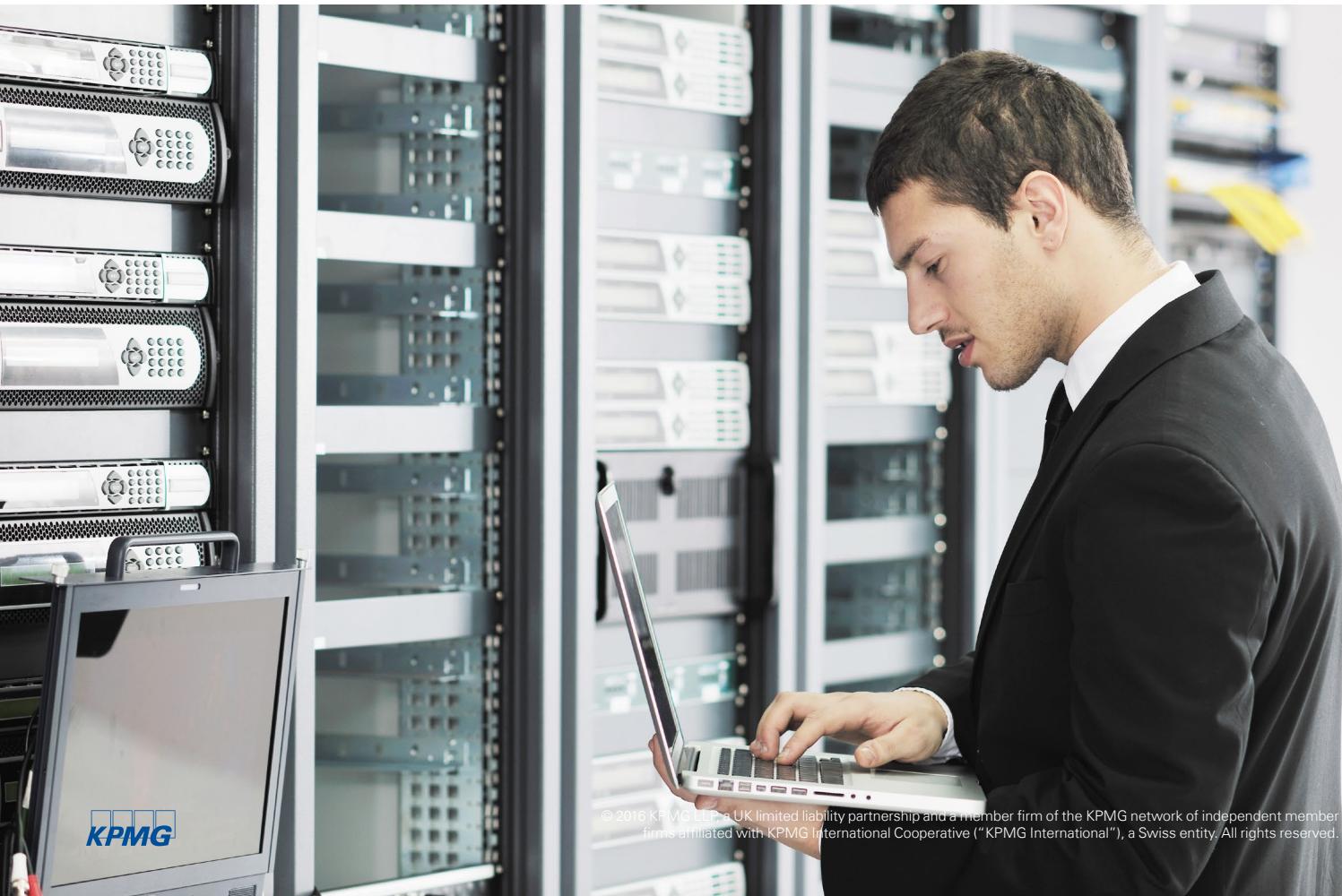
As you begin to lay the groundwork for cognitive automation in your business, here are three key areas of consideration:

Revisiting your company strategy to understand how you can leverage emerging automation platforms to digitise business processes, eliminate manual activities, and drive greater cost efficiency, responsiveness, productivity and innovation.

Rethinking your innovation and business models to harness these technologies and the ecosystems around them for new value propositions and competitive advantage.

Reconsidering your resource allocation to ensure you are positioned to manage widespread workforce change and enable a culture of innovation.

The Cognitive era is here. Are you ready to embrace automation to break transformation barriers and make every employee an innovator?



About KPMG

Working collaboratively and pragmatically alongside our clients, KPMG member firms help organisations improve service delivery models, reduce support costs, and drive specific business outcomes in order to achieve sustainable, continuous improvements and competitive advantage.

Our Numbers

- Member firms serving clients in 155 countries
- Hundreds of advisory professionals globally
- Providing services to 76 percent of Fortune Global 500 companies
- Supporting thousands of transformations

Our Differentiators

- Objectivity as advisors
- Beginning-to-end experience
- Functional breadth
- Industry-specific experience
- Technology and governance services
- Extensive data and analytics
- Proprietary research, tools, and intellectual property
- Industry relationships
- Integrated competencies and services

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Learn more

To discover more of KPMG insights on cognitive automation, robotic innovations, and the digital workforce, please visit

www.kpmg.com/uk/cognitiveautomation



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