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Intelligent Augmentation

Life sciences companies are a natural fit for digital labor, from robotics to cognitive

An organic fit in life sciences

Life sciences companies that aren't thinking about integrating enhanced automation into their workforces probably should be.
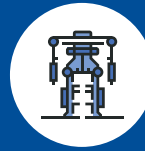
There is no doubt that the life sciences industry has changed. For example, while specialty pharmaceuticals may successfully replace blockbuster drugs, the longer research and development timelines and more stringent regulatory approvals mean that fewer products will be brought to market. In this environment, companies understandably want to launch products as cost-effectively and quickly as they can. They also need to ensure that the drugs and devices they produce are fulfilling unmet patient needs, as with rare diseases, and leading to better short- and long-term outcomes. Could digital labor be the answer?

Most life sciences organizations are already using some form of automation, such as lean and Six Sigma processes, software as a service (SaaS), or maybe even artificial intelligence algorithms. And they may have made inroads toward greater speed and flexibility by modernizing core enterprise systems. Finally, most have been realizing cost-savings for some time through business process outsourcing (BPO).

Many may question whether more advanced forms of automation – from robotic process automation (RPA) to enhanced process automation to cognitive technologies – are necessary. We seek to answer that question in this paper by illustrating how naturally advanced automation can be used in the life sciences back office, regulatory compliance, clinical trial process, pharmacovigilance efforts, and more strategic applications of data and analytics.

Human Labor: Traditional shared services and outsourcing, both on- and off-shore

RPA: Automation of transactional, rule-based repeatable processes

Enhanced Process Automation: Algorithms known as *smart bots* that execute judgment- and reasoning-oriented tasks

Cognitive Technologies: Machine learning and adaptive technologies that understand context, infer probabilistic answers, and extract valuable insights from Big Data

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More cost-efficient scaling of back-office IT

For back office functions like finance, IT and human resources, RPA and digital labor can be scaled much more quickly than traditional IT implementations. The code has built-in scalability and the architecture is modular. Further, these technologies have evolved so that they no longer require traditional platforms and desktop access, but can instead reside in the cloud.[i] In this sense, these technologies could be considered forms of Software as a Service – which companies already know eliminates the expense of integrating new software with existing systems.

Most important, RPA and digital labor can allow functions that were outsourced to be brought back in-house, or maintained at the outsourcer at a lower cost. For example, a pharmaceutical giant is currently taking the latter approach, relying on one of its India-based outsourcers to bring the company ideas for utilizing automated forms of labor. To date the company is using RPA to accelerate simple transactions, such as cash collections and invoice payments.[ii] However, the company reports that it sees the power of these technologies for more sweeping front- and back-office applications in the future.

By contrast, another prominent pharmaceutical company has made a larger commitment to automated labor, training 25 internal champions to program software, evaluate use cases and create pilots.[iii] In this way, the company is creating internal competencies in advanced automation that will differentiate the firm in the future.

It is important to remember that, no matter what pace a company takes in adopting digital labor, strategic thinking needs to go into such change management issues as whether to maintain some degree of outsourcing; whether displaced internal workers can be reassigned or retrained; and how digital and human employees can effectively work together.
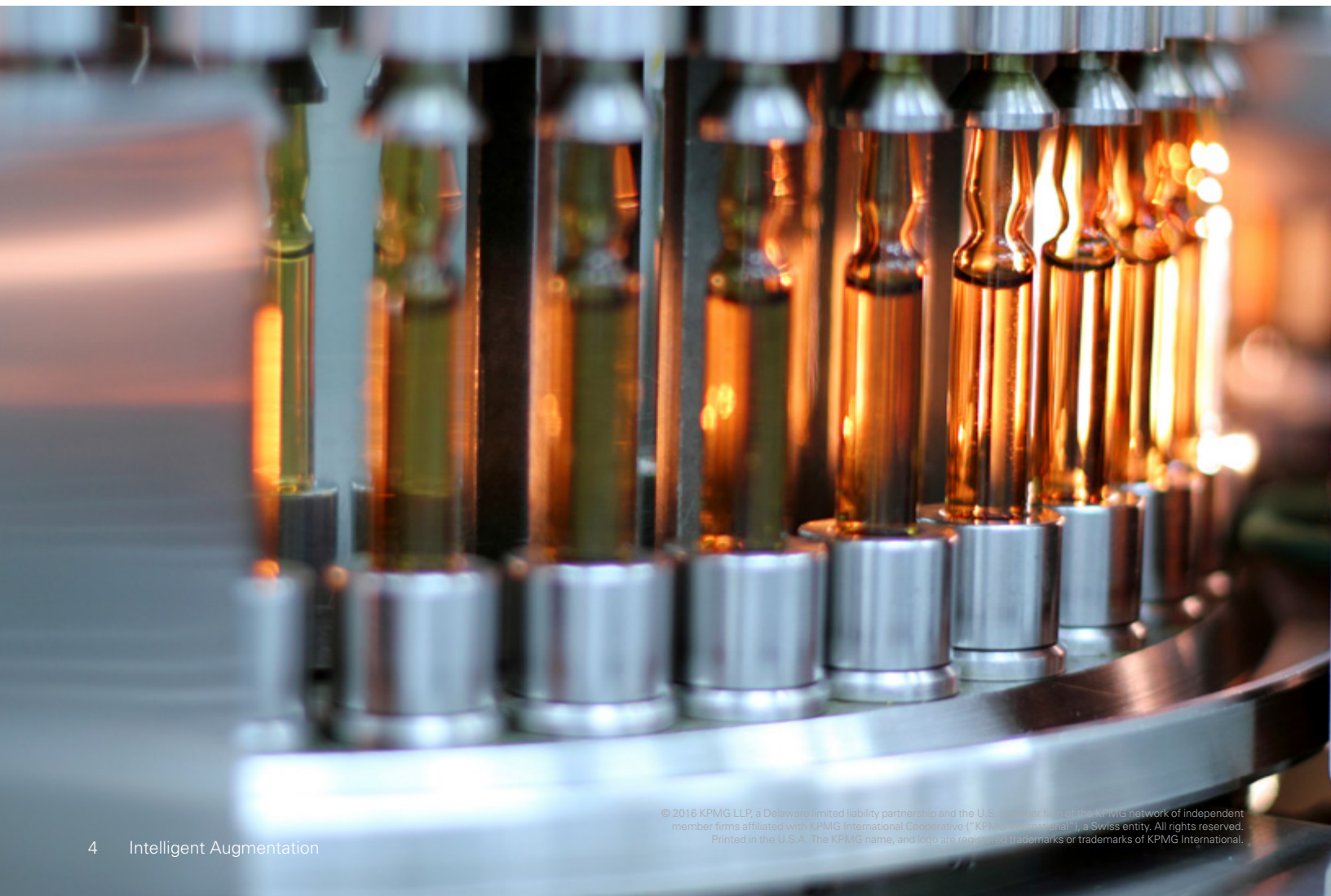
Faster Clinical Trials and Drug Releases

Digital labor has tremendous untapped potential when it comes to clinical trials, allowing companies to bring drugs to market on an accelerated timeline.

As specialty drugs supplant blockbuster drugs in companies' pipelines, the approval process is becoming more complicated. Clinical trials and patient populations comprise smaller cohorts. Accessing these specialized patient populations for clinical trials often requires international sites, which come with their own sets of regulations. And pharmaceutical companies must prove the efficacy and patient outcomes related to drugs they bring to market, or they will find their products excluded from health plan formularies.

Therefore, life sciences companies are exploring advanced automation to achieve efficiencies in the clinical trial process. This will range from rule-based automation for submission requirements and document tracking, to machine learning for product strategy and document creation, to cognitive learning for regulatory assessments and two-way communication with health authorities.

Further, as life sciences companies rely heavily on contract research organizations (CROs), they are continuously searching for ways to institute greater efficiencies and cost containment. Digital labor can take that efficiency several steps further.

The technology is particularly conducive to what many are calling *routine cognitive tasks*. These tasks are time-consuming and require a great deal of human capital, but are also structured and easily repeatable. Examples are data collection, statistical data entry, data quality oversight, regulatory submissions, and some compliance issues.[iv]

More rapid regulatory compliance

Digital labor can positively influence the compliance process, as well. As companies focus on new classes of drugs that fulfill unmet patient needs, their compliance burden is more complex than ever. Digital labor can simplify this process as the technologies have compliance built in, with all actions traceable and auditable.

Projecting forward a few years, life sciences organizations will be able to use cognitive technologies to keep pace with ever-changing regulations. Currently IBM's Watson is being used selectively in other heavily regulated industries to track required controls and obligations and eliminate those that are redundant, in real time. It is important to note that using cognitive for sweeping, real-time regulatory due diligence won't take away jobs from human workers because such rapid analysis of regulatory data is not possible today.

Increased accuracy in pharmacovigilance

As pharmaceutical companies face a growing responsibility to track outcomes and adverse events related to the drugs they manufacture, automating parts of the pharmacovigilance process will be a financial imperative.

There is potential for automating processes across the spectrum: rule-based automation for data capture and accurate data entry; machine learning for adverse event intake and customer service; and cognitive learning for the analysis of medical reports, quantitative studies, and quality measurement.

Turbocharging big data

In today's competitive healthcare environment, life sciences organizations differentiate themselves and their products by demonstrating improved patient health outcomes. It is critical to have reliable data related to population health statistics, total cost of care for certain disease states, and medication compliance patterns, as examples.

Digital labor can play a role in more strategic uses of data and analytics (D&A). The technology provides life sciences companies with real-time access to Big Data as it moves between systems. Cognitive computing is helping healthcare and life sciences companies make clinical decisions on a dramatically accelerated timeline. Further, digital labor boasts greater accuracy than human labor, removing the problem of human error from data entry and handling.

The need for change management

Fear of Workforce Displacement

Despite the promise of digital labor in both the back and front office, many in the life sciences and other industries still suffer from automation anxiety. Fears harken back to the first Industrial Revolution when English writer Thomas Mortimer famously said, "Machines would exclude the labor of thousands of the human race, who are usefully employed."[v]

In reality, it is much more likely that robots will become *adjuncts* to the traditional workforce. They will free up human capital for higher level tasks that require skills that cannot be automated, such as subjective decision-making, creativity, emotional intelligence, and communication.[vi] In life sciences, this could mean that workers will be retrained and transitioned to roles involving market research, launch planning and brand management, for example.

KPMG Chief Economist Constance Hunter supports the idea that robots are more enabling than threatening to efficient labor. She says, "Digital labor from the ATM to Watson has so far enabled complementary assistance to human knowledge workers." According to one of the leading voices of the so-called *Fourth Industrial Revolution*, Professor Klaus Schwab,

there is an even greater need for human thought in the face of advanced technology. He says, "All of these new technologies are first and foremost tools made by people for people."[vii]

On a macro level, embracing digital labor is integral to the United States maintaining its standard of living over the next ten years, according to Cliff Justice, KPMG's Advisory Leader for Cognitive Automation. As countries like Japan, China and Germany adopt automation to offset a shrinking work force, the U.S. will have no choice but to keep pace. According to Professor Schwab, in the near future "economic and political power will be determined less by a country's size than by its technological superiority."[viii] For life sciences companies, competing on a global playing field to achieve parity with other firms throughout the world is particularly critical.

"Digital labor from the ATM to Watson has so far enabled complementary assistance to human knowledge workers."

— Constance Hunter,
KPMG Chief Economist

Lower labor costs

The benefits of digital labor are significant. Currently, white collar labor accounts for 27 percent of costs worldwide, according to the Bureau of Labor Statistics Employment Cost Index. [ix] Life sciences companies have long relied upon outsourcing to keep these costs in line. While traditional outsourcing offers a 15 to 30 percent cost takeout, automation technologies boast savings of 40 to 75 percent for certain functions.[x] And these are permanent cost savings.

For these reasons, nearly half of all life sciences companies are already putting digital labor to work in the back office. Some are already realizing 20 to 30 percent cost savings incremental to the savings of offshore outsourcing.[xi] One of the starting points for many companies is using RPA across financial functions, e.g., *Record to Report* processes including general ledger close and end-of-the-month reporting. As shown in the chart below, estimated savings in this area can range from $5M to more than $10M.
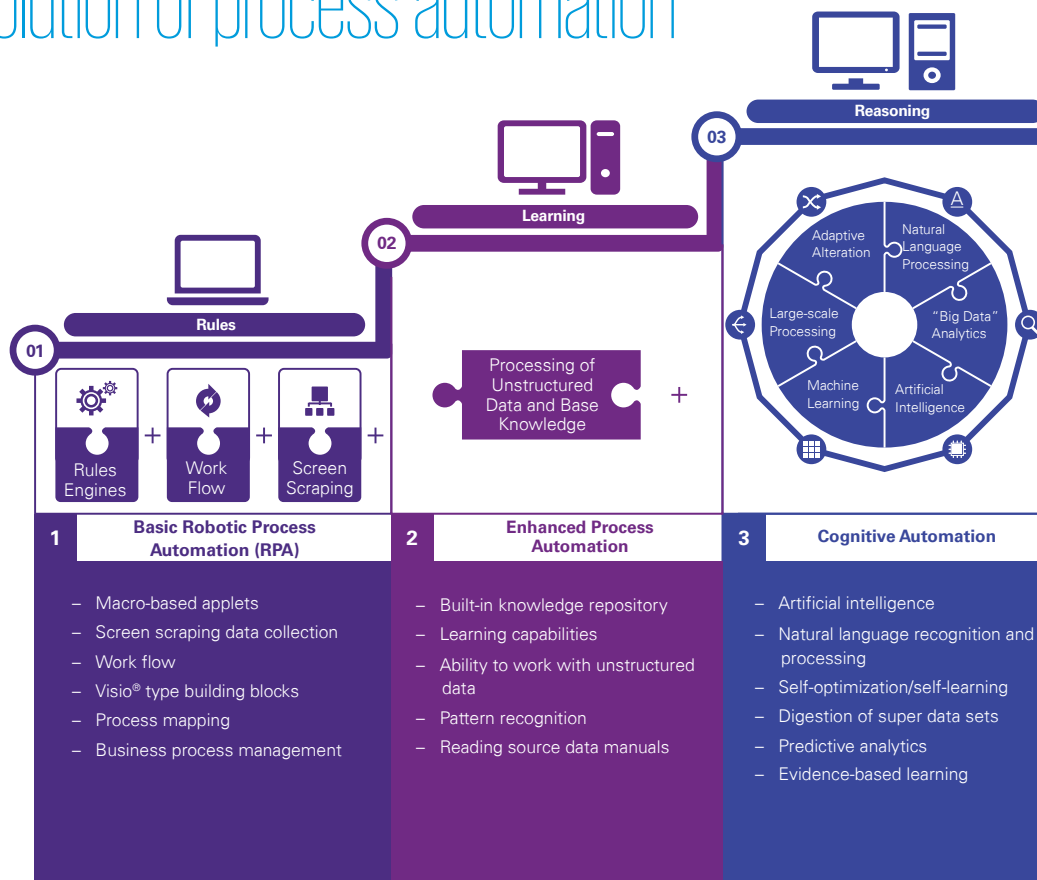
Shorter, More Cost-Effective Implementations

Digital labor can be implemented and used productively in less than a year. This is significantly more time efficient than traditional technology engagements, which often run for multiple years and lock up significant capital.

Digital labor implementations can be achieved for tens of thousands rather than tens of millions of dollars. The projected return on investment is staggering: London School of Economics research suggests that robotic process automation investments will yield a return of 600 to 800 percent for certain tasks. [xii]

Estimated cost savings using digital labor

ID	Process Area	Process	Est. Opportunity (millions)
1	Quote to Cash	Collections	$5.9+
2	Record to Report	Close & Reconcile	$8.8+
3	Record to Report	GL Close	$6.3+
4	Procure to Pay	P-Card Administration	$21.5+
5	Plan to Forecast	Forecast performance	$14.5+
6	Plan to Forecast	Performance Reporting	$12.5+
7	Plan to Forecast	Create annual op plan	$10.5+

The evolution of process automation

	Basic Robotic Process Automation (RPA)		Enhanced Process Automation		Cognitive Automation
1	**Basic Robotic Process Automation (RPA)**	**2**	**Enhanced Process Automation**	**3**	**Cognitive Automation**
	– Macro-based applets		– Built-in knowledge repository		– Artificial intelligence
	– Screen scraping data collection		– Learning capabilities		– Natural language recognition and processing
	– Work flow		– Ability to work with unstructured data		– Self-optimization/self-learning
	– Visio® type building blocks		– Pattern recognition		– Digestion of super data sets
	– Process mapping		– Reading source data manuals		– Predictive analytics
	– Business process management				– Evidence-based learning

Aren't we already using robotics?

Of course, life sciences companies have been using robotics on the manufacturing floor for many years. And they have even been using RPA in the back office for some time. However, over the last 18 months, the robotics ecosystem has matured and grown. Companies have evolved from robotics projects focused on finite issues to scenarios where digital labor is core to companies' global business services (GBS) and clinical trial models, and thus require both business- and IT-oriented perspectives.

As digital labor is used in more mission-critical operations, it must gain enterprise scope with appropriate governance and risk management. Governance programs should act as *air traffic controllers*, mediating and reconciling systems. As an example, a company can have basic robotic process automation for GBS, several automation vendors for financial processes, and cognitive computing in the research lab. When it comes to risk management, allowing robots to handle a process still requires review by the human workforce. Therefore, companies should continue to apply a detailed review process to ensure quality and accuracy.

How to get started

With low costs, short implementation timelines and an improving ecosystem, there is no better time to start thinking about digital labor. However, before going out and buying a new software package, life sciences executives should take a systematic approach from assessment to implementation. The following are the four steps KPMG takes with companies seeking to begin their digital labor journeys:

Phases:

1 Innovation Discovery

The first step is to conduct a readiness assessment. As noted, many life sciences organizations have already invested in robotics to some extent, so it is important to gather and catalogue these capabilities so that you can build upon prior knowledge and systems. This phase involves three major tasks: an online readiness assessment; a *Phase 0* workshop in which inefficiencies are identified; and a Phase I assessment, which involves targeting a few processes, conducting process mapping, and creating an opportunity statement of where RPA can lead to time- and cost–savings.

2 Insight into vendor partnerships

Once all current processes and objectives have been assessed and documented, organizations can start to think about the technology and tools they will need to operationalize their plans. In part, this is about finding the right solutions to meet the long-term goals and specific requirements of the organization. However, life sciences leaders should also consider partnering with a handful of key vendors to develop customized capabilities and accompany them along the full pathway to automation.

3 Strategy and roadmap

The critical first phase, and most likely the second phase, will culminate with a multi-faceted strategy and roadmap for implementing automation in the organization. This involves detailed use cases; user personas; quantitative and qualitative benefits models; journey mapping; a preliminary solution concept and architecture; and, as discussed above, a governance model and change management plan.

Conclusion

Digital labor is here and astonishing uses of cognitive computing are just around the corner. While many life sciences companies are starting to plan for more sophisticated digital labor implementations, they are realizing real benefits from RPA today. RPA handles repeatable tasks three to five times faster than traditional methods; it offers 20-30 percent cost-savings; and it allows life sciences companies to pursue growth strategies without increasing the staff that handles certain back-office tasks.

No matter where life sciences companies find themselves in this continuum, moving forward and using digital labor as a competitive differentiator will require a strategic roadmap. Robotics solutions will only be as smart as the people putting them in place.

How KPMG Can Help

The healthcare and life sciences professionals at KPMG LLP (KPMG) are currently helping companies transition their back- and front-office functions from human labor to RPA and laying the groundwork for cognitive computing. Our basic process automation (RPA) engagements involve adding workflow automation and rules to less complex but critical tasks. Our enhanced process automation engagements allow unstructured and structured data to be used in knowledge repositories, and help companies apply fixed learning capabilities and natural language processing to more complex tasks, such as IT Help Desks. Finally, through our partnerships with IBM and other leaders in the cognitive space, coupled with the capabilities of our in-house data & analytics center, we have our finger on the pulse of how self-learning computers and artificial intelligence can be applied to predictive analytics and automated decision making.

In all cases, we believe that automation is not simply an IT issue, but should be built into business process design, transformation efforts and human capital decisions. These implementations also require IT expertise related to choosing software and service providers, as well as systems integration.

Finally, instituting automated labor necessitates an incremental change management program to overcome organizational resistance and provide reassurance about the continued value of human capital and the need to integrate digital labor into evolving workflow processes. At the end of the day, we believe that *intelligent automation* is most valuable to companies that use these technologies as *intelligent augmentation* of their human workforces.

4 Implementation

This is a much longer term proposition and will ultimately involve pilot programs; configuration of robotic process automation and cognitive solutions; measurement and reporting; and activation of governance, change management and education programs.

[i] *Robotic Process Outsourcing in Shared Services, IQPC.*

[ii] *Robotic automation @Merck. https://www.youtube.com/watch?v=gBF8cN5lpjw*

[iii] *Hodges, R. (2016). Robotics process automation, LinkedIn. https://www.linkedin.com/pulse/robotic-process-automation-randall-hodges*

[iv] *Anonymous (2016). Outsourcing and robots: How smart pharmas are optimizing R&D operations, Pharmafile. http://www.pharmafile.com/news/503664/outsourcing-and-robots-how-smart-pharmas-are-optimising-rd-operations.*

[v] *Rosen, R.J. (2015). In praise of short-term thinking, The Atlantic. Economic Forum.*

[vi] *Robotic Process Outsourcing in Shared Services, IQPC.*

[vii] *Schwab, K. (2016). The Fourth Industrial Revolution, World Economic Forum.*

[viii] *Schwab, K. (2016). The Fourth Industrial Revolution, World Economic Forum.*

[ix] *Bureau of Labor Statistics. http://www.bls.gov/ncs/ect/.*

[x] *The Outsourcing Institute (2014).+ Three secrets your traditional service providers are not telling you.*

[xi] *Robotic Process Outsourcing in Shared Services, IQPC.*

[xii] *Press Release: "Cognitive Computing Market worth $12,550.2 Million by 2019," Markets and Markets.*

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