Preparing IT Operations for a Digital Business Future

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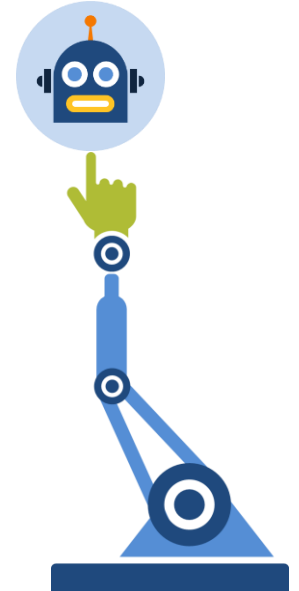
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Introduction

The emergence of a digital economy is one of the most significant business disruptions of the past century. Enterprises are turning their focus from developing physical assets and supporting permanent locations to developing digital products and supporting cyber locations that combine with, or completely replace, their physical predecessors. Case in point: business leaders now indicate that digital offerings are contributing more to their growth than are traditional offerings[1].

In this new digital economy, business models will be based on technology platforms and smart machines, all of which will require exponentially higher levels of availability, security, scalability and interoperability. This transformation is well under way and is putting tremendous pressure on enterprises to rethink traditional business models—and to create new ones. This means expectations are mounting for CIOs and enterprise IT organizations to help deliver these new technology-focused business models.

Regrettably, most enterprise IT organizations are unprepared to support this strategic shift. The majority of the IT budget, and therefore the majority of its focus, is spent maintaining yesterday's legacy investments rather than driving forward tomorrow's digital business future. To be clear, it is not that

the IT organization does not *want* to support innovation, it's that it *can't* support innovation. There is simply too much complex legacy technology that must keep running.
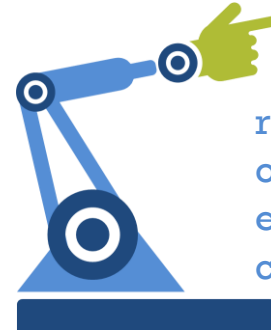
> The pace of digital business will require a complete rethinking of the enterprise IT operating model, with a focus on exponentially increasing today's commonly accepted levels of speed, scale and quality.

This is the fundamental problem all IT operations leaders must face as digital business races from promise to reality. The traditional IT operating model, whereby people follow a process with technology playing a supporting role, will not be competitive in the 21st century—it lacks the speed, scale and the embedded intelligence enabled by analytics needed for today's hyper-competitive economy.

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[1] ISG Insights Digital Business Survey, 2015, N=129 & 2016, N=141 "C-level" Bus/IT Leaders

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Enterprises need an IT operating model in which *technology follows a process with people supporting, as needed*. This is the only model that will be able to react with the requisite agility, scalability and cost-effectiveness to support businesses that are now competing on a digital timescale—a timescale measured in minutes and hours, rather than days and weeks. IT organizations that are deploying the operational platforms to support this shift will create a strategic advantage by amplifying their best engineers and analysts with technology to create a new *digital workforce*.

"Given how fast businesses are moving today, the ability to deliver increased speed and quality, while keeping costs flat, is critical."

— Sector Lead, IT and Business Services Company

IT Leaders Face Daunting Challenges

While the IT function is pressed to focus on business innovation, it is often overwhelmed by operational challenges—some within its scope of control and some outside it. A day in the life of an operations leader often includes some combination of the following issues:

- **Too many events**. The number of alerts spawned from event management and monitoring systems has exploded with the introduction of mobile devices and the Internet of Things (IoT). To address the overwhelming number of incidents, operations functions have attempted to intelligently suppress events to reduce the number of alerts, but this approach leaves valuable data untapped – data that could be used to proactively solve or even avoid future problems.

- **Increasing security threats**. The number of cybersecurity threats are growing at a pace no human can possibly address. The introduction of connected devices into corporate networks will only exacerbate this challenge as a torrent of often-poorly secured devices come online, creating millions of new events and associated incidents.

- **Service delivery challenges**. Many IT organizations lack the ability to move out of a "firefighting" mode because of the inconsistent way they apply knowledge to solve recurring problems; they also lack the analytics to avoid problems in the first place. Adding fuel to the fire:

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services agreements have become smaller while increasing in number[2], and business units are taking more ownership of these smaller deals, which means service delivery will become increasingly fragmented as smaller "black-box processes" proliferate.

- **Concerns about speed and agility**. Enterprises are rapidly moving from the traditional waterfall-based approach to agile frameworks. In this model, product development happens in sprints, with a focus on getting a minimally viable product to customers as soon as possible. This new delivery model focuses on speed rather than process, often creating a situation in which technology demand far outpaces IT's ability to supply it.

Looming over all these operational challenges is the specter of flat-to-shrinking budgets. IT leaders are on a near-constant search for cost savings, but most traditional cost-reduction levers have been exhausted. Many IT organizations have extended the life of data center assets, for example, to avoid costs associated with new hardware and software. As more organizations outsource their data center operations or move portfolios of applications to a cloud-delivery model, they have fewer assets to extend. The search for cost reduction, then, leads IT leaders to exert pressure on IT service providers, who now own and manage many of these assets. This means providers are under tremendous pressure as well, and any short-term, single-digit savings often result in downstream quality issues.

Labor arbitrage as a cost savings lever is also running its course. Because leading offshore service providers are in a war to find local talent with capabilities in areas such as analytics and cloud, it's no longer a given that offshore rates will beat onshore rates by 20 to 30 percent. This factor, combined an emerging global middle class, are coming together to weaken what was once the automatic cost-reduction lever of labor arbitrage.

A next-generation IT operating model will be based on the idea that a digital workforce will execute day-to-day operations, freeing up engineers to focus on more value-added work.

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[2] ISG Index, 2016

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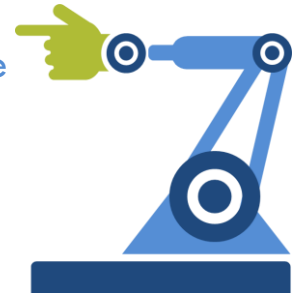
Many IT leaders are beginning to realize this emerging reality: the only way to address system complexity, add scale and increase quality while keeping costs flat is to introduce automation into their operations[3]. However, to realize these benefits, leaders need to move beyond scripts and runbook automation. They must evolve their IT operating model beyond one that focuses on a human workforce developing and executing a process supported by technology to one that relies on technology that follows a process supported by humans. This is a critical distinction. While ITIL remains a highly-relevant framework to define how work gets done in IT, it is important to remember that it was developed at a time when humans played the prominent role in IT operations. As virtual agents and engineers increasingly supplement and even replace these operational roles, it will be critical for operational leaders to re-evaluate many long-standing processes in order to keep pace with digital business demand.

Digital Workforce Platforms Have Arrived

Physical robots have been performing work in agriculture and manufacturing for decades. Business leaders in these sectors recognized long ago that for specific use cases, robots can dramatically improve productivity, quality and speed. What has emerged recently is the idea that *software robots* can produce the same kind of results in the services sector. However, rather than working with physical inputs and outputs, software robots work with digital inputs and outputs. Their result, in many use cases, is the same: dramatically improved productivity, quality and speed.

Enterprise IT software robots, otherwise known as "virtual agents" or "virtual engineers," are designed, deployed and managed by a new class of

"The combination of analytics and virtual engineers means that, with one click, we not only solve the immediate problem, but any similar problems in the future are resolved autonomously."

—— *Head of Global Infrastructure, Medical Company*

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[3] ISG Digital Platform Survey, 2016, n=352

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systems known as Digital Workforce Platforms (DWPs). These systems are distinct from traditional IT automation approaches, which typically rely on either procedural scripting languages, or on workflow and messaging approaches – all of which interface with other systems at an application or database layer. These traditional automation approaches are based on the idea of a fixed start and end point and lack analytics needed to help make decisions about how to solve problems in a dynamic way. In contrast, DWPs are dynamic. They rely on historical and incoming operational data to make recommendations and decisions. How these platforms make recommendations and decisions depends on where they sit on the spectrum seen in Figure 1.

Figure 1: Traditional Enterprise Automation vs. Digital Workforce Platforms

Scripts & Runbooks	Workflow Systems	Expert Systems	Machine Learning Systems	Intelligent Systems
▪ Programmed. ▪ Procedure-based.	▪ Configured. ▪ May perform work as if it were a human.	▪ References knowledgebase & uses inference system. ▪ Experts provide feedback on quality of decisions.	▪ Algorithms are "trained" using data, not experts. ▪ Assesses probability and classifies results.	▪ Uses biology as foundation to understand patterns, make predictions & develop behaviors.

Enterprises have traditionally focused here

While digital labor will focus here.

Source: ISG Research, 2016

Some DWPs operate as expert systems, which leverage an extensive knowledgebase and an inference system to determine the next best operational step. Machine learning-based DWPs use algorithms to determine how to best solve an operational problem – these algorithms improve over time as they are trained using more and more operational data. An emergent class of intelligent systems uses the human brain as the foundation for how to understand patterns. These DWPs are especially well suited for human-to-human communication in service desks, for example.

DWPs deployed against IT operations can diagnose incidents, identify the best solution and resolve the underlying problem using standard operating procedures. They can also proactively solve similar future problems without the need for human intervention. Leading DWPs can also mimic human behavior by watching how human engineers solve a particular problem and creating an automation based on this learned behavior.

DWPs are most commonly being used in scenarios where IT needs to add FTE-based capacity, or to increase speed while keeping costs flat. Some enterprises are adding digital labor to their service delivery model to:

- **Add capacity to the network management function**. Given the explosion of connected devices from employees as well as emerging IoT pilot projects moving into production, IT leaders are overwhelmed by the devices that are connecting to their network. Our research shows that the use of DWPs is increasing network productivity, measured by

the number of devices managed by FTE, up to 100 percent in some cases.

- **Reduce mean time to resolve at the service desk**. The pace developers and business units must move to get digital products to market is dramatically compressing traditional incident-resolution timelines. This is where digital labor, created by DWPs, can help. For example, an IT leader at a financial services company estimates his firm's DWP has reduced the mean time to resolve for Level 1 service desk incidents by 96 percent.

- **Redirect resources from problem and change management.** Diagnosing the underlying root cause of problems and documenting associated changes takes significant human resources. Critical systems like the configuration management database (CMDB) are often bypassed during these labor-intensive processes. IT leaders who are applying digital labor to this challenge are reducing the number of people required and increasing consistency of process and system documentation. At a medical imaging company, for example, an IT leader was able to reduce the number of service management personnel from six to one.

A DWP does not require extensive transformation of the IT environment. Instead, it is inserted into an environment as if it were a new systems engineer—an engineer that diagnoses, remediates and learns exponentially faster than any human ever could. DWPs sit on top of existing event

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management and monitoring tools, and intercept events to determine the next best step. These systems interact with other key IT systems like IT

service management, updating them as they diagnose and resolve issues across IT towers.

Figure 2: Digital Workforce Platforms in IT Operations

Source: ISG Research, 2016
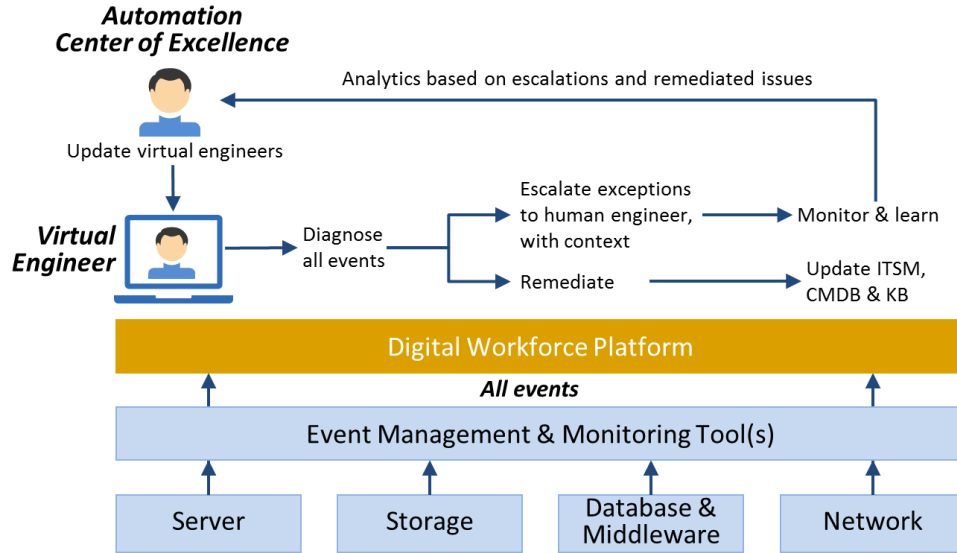
Digital Workforce Platforms:

- Integrate into existing tools and processes
- Operate like human engineers, using the same tools and SOPs
- Intercept and analyze all events, rather than suppressing them
- Make human engineers more productive, by pre-diagnosing events
- Use analytics to continuously improve operations over time.

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IT Leaders Should Carefully Consider Digital Workforce Deployment Models

While our research indicates substantial productivity, speed and quality improvements associated with DWPs, IT leaders should carefully consider how they insert digital labor into their delivery model, as this will determine the outcomes they will be most likely to realize. We see three digital labor deployment models emerging:

1. **Do it yourself (DIY).** In this model, companies buy and implement a DWP. They may perform the implementation themselves, use professional services from the DWP vendor, or hire a systems integrator. DIY buyers are not seeking cost reduction but are looking to add capacity to their environment without hiring additional staff. In nearly every use case we analyzed, a strong automation champion is driving the digital labor agenda. This champion is usually supported by a small team, creating an automation center of excellence (COE). A growing number of IT leaders are successfully using agile approaches such as sprints, story points and backlogs to identify, design, test and implement automation in their environments.

2. **Embed in outsourcing.** Near-term cost reduction and long-term cost avoidance remain the top reasons companies outsource – and this is unlikely to change with the introduction of digital labor. What has changed is the degree to which a company can realize these cost-related benefits via outsourcing. DWPs help service providers dramatically increase productivity and reduce the number of people required to support a service, which in turn reduces both near-term and long-term costs for outsourcing buyers[4].

3. **Automation-as-a-Service.** In this model, companies buy and implement a DWP, but the software provider also provides an automation COE, as-a-service. Given the demand for experienced automation and machine-learning resources, these individuals will be difficult to find – and even harder to retain. Leading DWP providers are recognizing this trend and are providing their expertise as a managed service, helping companies further drive digital labor into their organization through a combination of on-site resources, access to a library of common automations, and coaching on ways to extract more value from the DWP.

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[4] ISG Automation Index, 2016

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Figure 3: Digital Labor is Increasing Productivity in ITO Contracts

Tower	Volumetric	Year One Productivity Improvement (%)
Applications	Number of Applications Managed	+30%
Data Center	Number of Virtual Instances Managed	+29%
Data Center	Storage GB Managed	+34%
Service Desk	Number of End Users Supported	+20%
Workplace Services	Number of End-User Devices Managed	+85%
Network and Voice	Number of Network Devices Managed	+100%

Source: ISG Insights

With the use of Digital Workforce Platforms, service provider productivity is skyrocketing, leading to significant savings for outsourcing buyers.
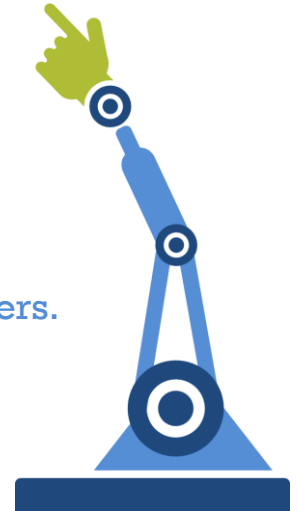
Digital Workforce Platforms Turbocharge Human Productivity

For the last two decades, IT leaders have worked to balance IT operations cost, speed and quality. First and second-generation outsourcing contracts have, for the most part, addressed cost reduction by using offshore labor and standardized processes. However, in most cases, outsourcing has fallen short of speed and agility expectations. While in-house IT delivery models often solve the speed and agility challenge, they don't typically benefit from labor arbitrage and process discipline enforced by an outsourcing contract, and therefore, cost suffers.

Digital labor, enabled by DWPs, promises to solve for all three. DWPs will transform the IT operations function by making *existing staff significantly more productive*. A newfound partnership between a human workforce and a digital workforce will create an environment that will:

- **Focus on what is important**. If an event does require human intervention, the context of the problem, as well as an audit trail of how the virtual engineer attempted to fix the problem is included in the escalation, reducing the time a human engineer needs to spend on problem resolution. This partnership will drive down the number of incidents that require human attention, allowing employees to focus on higher-order problems and changes.

- **Scale faster**. A digital workforce never sleeps and can be increased instantly with the marginal cost of a digital asset. Digital labor scalability will only be constrained by the slowest link in the human-base process it supports.

- **Improve over time**. Given where DWPs sit in the IT architecture, they analyze a vast volume of operational data. Leading IT functions will analyze the operational data surfaced by the DWP and use it to make future decisions regarding 1) what to automate and 2) how to best automate it.

"Digital labor enables us to do more work with our existing staff, and has helped us to dramatically reduce our mean time to resolve from four hours to ten minutes."

— *Global Leader for Automation Center of Excellence, Financial Services Company*
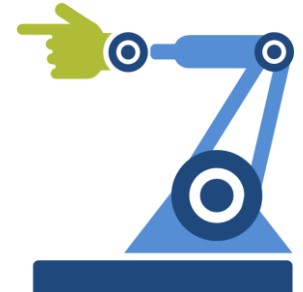
- Reduce churn and re-work. Virtual engineers don't need to be re-taught the same knowledge. Once a VE understands how to solve a problem, it will consistently apply this knowledge every time. VEs don't take breaks, don't take vacation and follow standard operating procedure, every time.

As DWPs proliferate across IT departments, human engineers will spend less time managing recurring maintenance activities and more time on higher-order work. No matter the deployment model – DIY, outsource or automation-as-a-service, the combination of human labor with digital labor will create increases in scale, speed and quality that no human-only workforce can possibly match.

Call to Action

Digital labor is here. Savvy IT operations leaders will embrace this transformation, and will seek to pair their best engineers with virtual engineers, dramatically increasing their productivity, speed and quality, enabling them to further support digital business transformation. We recommend the following next steps:
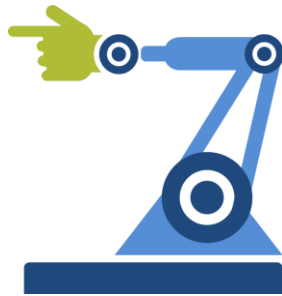
- **Define your outcomes.** Do you need near-term cost reduction, achieved via outsourcing, or long-term cost avoidance, achieved via implementing the software internally? Defining the primary goal for your digital labor initiative will determine how you get there.

- **Identify a digital labor champion and develop a digital labor center of excellence.** The most successful digital labor initiatives are being driven by a process-oriented champion. Support this leader with a cross-functional team of both process and technology experts, along with a number of professional services resources from the DWP software vendor.

- **Use agile approaches.** Focus on a minimally viable product (MVP) rather than trying to automate everything in the first release. Adopt agile approaches such as sprints, scrums and automation product backlogs to drive digital labor into the environment quickly. Be sure to track success via quantifiable metrics.

- **Standardize and prepare your environment.** Virtual engineers will only be as good as the standard operating procedure they are executing. IT leaders should be prepared to spend significant time in process design/re-design as part of any digital labor effort. The CMDB is also a critical component to this initiative, so ensure this is as up-to-date as possible. Spend time re-thinking many of your ITIL-based processes, especially those built around the idea that a human is executing them.

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- **Sell the benefits of digital labor.** While the mention of the word "automation" leads many to believe their jobs may be in jeopardy, our research indicates very few companies are using it as a way to reduce headcount. Instead, companies are using DWPs to make their existing employees more productive. A virtual engineer can take over repetitive work and free up employees to focus on more value-added activities.

- **Think about your future workforce.** It is critical that IT operations leaders begin to think now about the kinds of skills they will need over the next 24 to 36 months. Likely, skills more closely aligned with agile, DevOps, APIs and Cloud will be more important than more traditional change management skills, as the latter will increasingly be performed by virtual engineers.

As digital business continues to redefine the mantra from *IT supports the business* to *IT is the business*, the role of IT operations will become increasingly vital. However, IT cannot be the business tomorrow until it addresses the operational challenges of today. And it cannot address today's challenges using legacy processes and tools. Traditional approaches to IT operations simply cannot respond fast enough to address the tsunami of change rushing through enterprise IT organizations. To be effective in digital business, at the center of which is scale, speed and a seamless customer experience, IT organizations will need to dramatically improve the productivity of their employees, by pairing them with a virtual workforce. DWPs will be integral to the creation, management and improvement of this next-generation workforce.
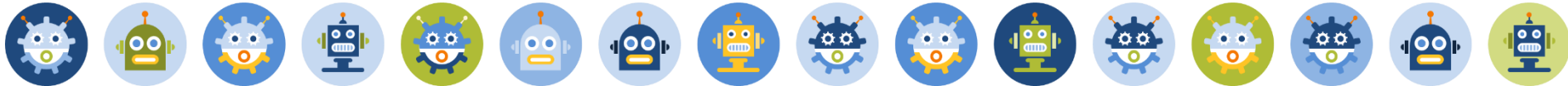
Sponsor Perspective: IPsoft

Imagine if there was a power outage and your lights went off. But instead of the utility working behind the scenes to quickly restore power, they made you contact them, write up an explanation of the problem and wait for a few days while they looked into the situation. This is essentially how we are running technology systems in modern-day companies.

By embracing a new wave of automation and artificial intelligence technology, IPsoft believes a better future is within our grasp. In this new world we will use virtual engineers and agents to automate repair jobs and tasks without human intervention, making life easier for both tech workers and users of business technology. As a result, IT managers will be more like conductors, training virtual engineers and orchestrating efforts between humans and machines so they work together seamlessly. Instead of tech workers devoting time to managing routine tasks, these brilliant minds will be unshackled from the ordinary to develop creative solutions that truly enhance the performance of a business.

Given the growing complexity of the IT environments we operate, intelligent automation is an imperative. The Internet of Things is pushing current IT organizations to the breaking point as digital and physical worlds merge across an intricate network of sensors coursing with data. We are rapidly approaching the limits of what humans can process.

IPsoft has implemented proven autonomic and cognitive technology that makes it possible for companies to grow at scale without sacrificing quality, cost or agility. Today, our automation technology uses virtual engineers to process 56 percent of all events without human intervention, and up to 90 percent of lower, level-one events. Our clients, which number 2 in 10 Fortune 1000 companies' IT operations, typically see greater than 30 percent gains in efficiency within 90 days. And incidents are resolved with a 60 percent average reduction in mean time to resolution.

We are driving toward improving these outcomes even further by layering cognitive technology on top of the autonomic backbone, so that workers will no longer have to be pulled down into the muck of technology to solve many problems. In our engineering labs, we are teaching our cognitive agents about common IT processes so they can hit the ground running and help our customers absorb the rising tide of user queries without sacrificing quality or multiplying costs.

In this new workplace human and digital employees will work together to simplify the management of our connected world and maximize the finite resources we have available to manage it. For further information contact Sean Connolly, IPsoft Advisor Relations, at **Sean.Connolly@ipsoft.com** to discuss how IPsoft can transform your IT operations.

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