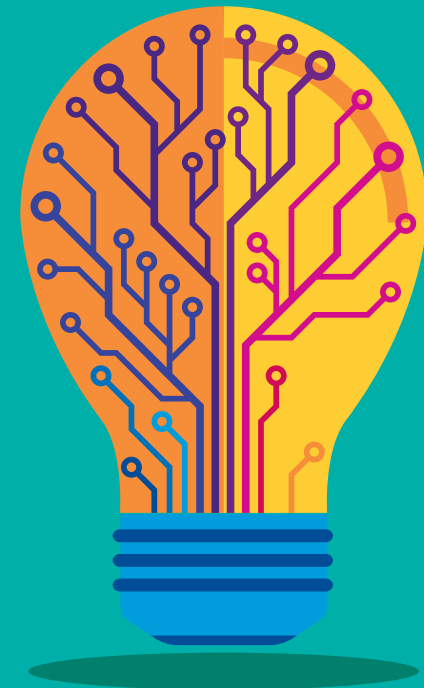




# The Creative CIO's agenda: six big bets for digital transformation

CIO Advisory

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# Introduction

There has never been a more exciting or challenging time to be a CIO. The fourth industrial revolution is here, being driven by the rapid introduction of diverse and disruptive technologies, creating enormous opportunities for both new and existing businesses.

These technologies also have significant societal impacts as smartphones and apps saturate the developing world and a more tech-savvy population eagerly adopts the latest new thing. CIOs that can deliver a competitive advantage for their business are those that understand the implications these technologies will have and can harness them to create new business models, products, services, and ways of engaging with customers. But speed is of the essence. In the past the business was at the mercy of the IT department for all of its technology-enabled solutions. Now however, they are increasingly discovering that the proliferation of cloud-based services enables them to source and provision their own solutions, effectively disintermediating their IT department. The confluence of new technologies, alternative sourcing options and tech-savvy stakeholders is potent enough to unleash significant disruption in the way IT organizations operate and deliver value to their stakeholders.

CIOs by virtue of their deep understanding of the organization's existing technology estate and awareness of emerging disruptive technologies are extremely well-positioned to organize and lead digital transformation. Without a strong leader to drive an enterprise-wide digital business vision and strategy there is a high risk that function owners may pursue initiatives independently that might lead to some quick wins but will ultimately saddle the organization with redundant solutions and disjointed data. This could create longer term problems including increased operational costs, inability to effectively exploit data, and exposure to security and compliance risks.

The recent Harvey Nash/KPMG 2016 CIO Survey revealed that 44% of large enterprises (reported annual IT budgets in excess of US\$250 million) have an enterprise-wide digital vision and strategy but 35% have them only within individual business units<sup>1</sup>.

Through KPMG member firms' experience with digital disruption, we identified six "big bets" that CIOs must consider now to position their organizations to be digital-ready, so as to innovate and remain relevant in the fourth industrial revolution. These six bets are described in the remainder of this report.

<sup>1</sup> *Harvey Nash / KPMG 2016 CIO Survey*

# The fourth industrial revolution

Emerging technologies are appearing at an accelerated pace, as demonstrated by their quick adoption by new start-up companies that are often disrupting entire industries<sup>2</sup>. Klaus Schwab, founder and executive chairman of the World Economic Forum (WEF) believes that we are at the beginning of the fourth industrial revolution<sup>3</sup>. The first industrial revolution began around the middle of the 18th century and marked a shift from an agrarian society to a mechanical one.

The invention of the steam engine made it possible to build factories and manufacture products anywhere, freeing them from dependency on water for power. It also led to the development of railroads that opened new markets. The late 19th century ushered in the second industrial revolution as the generation and distribution of electricity and the division of labor led to the assembly line and mass production. The computer and information technology marked the beginning of the third industrial revolution and enabled the automation of production.

Some argue that today's digital transformation is the logical continuation of the third industrial revolution but the WEF's Schwab believes that the speed and magnitude of change are distinct enough to mark the beginning of a new industrial revolution. Specifically, he points to three reasons:



## Velocity of change

the rate of change has become exponential versus the linear speed of the past



## Breadth and depth

building on the digital revolution it combines several disruptive technologies leading to paradigm shifts in the economy, business, society, and individuals



## Systems impact

it transforms entire systems across countries, companies, industries, and society as a whole

At KPMG we believe that the combined effects of disruptive technologies and a technology-savvy population eager to embrace them will have a profound impact on the world as we know it. The fourth industrial revolution will be marked by the ability to make almost anything, connect almost everything from everywhere, datify and digitize almost everything, access virtually unlimited content and compute cycles, and automate knowledge work.

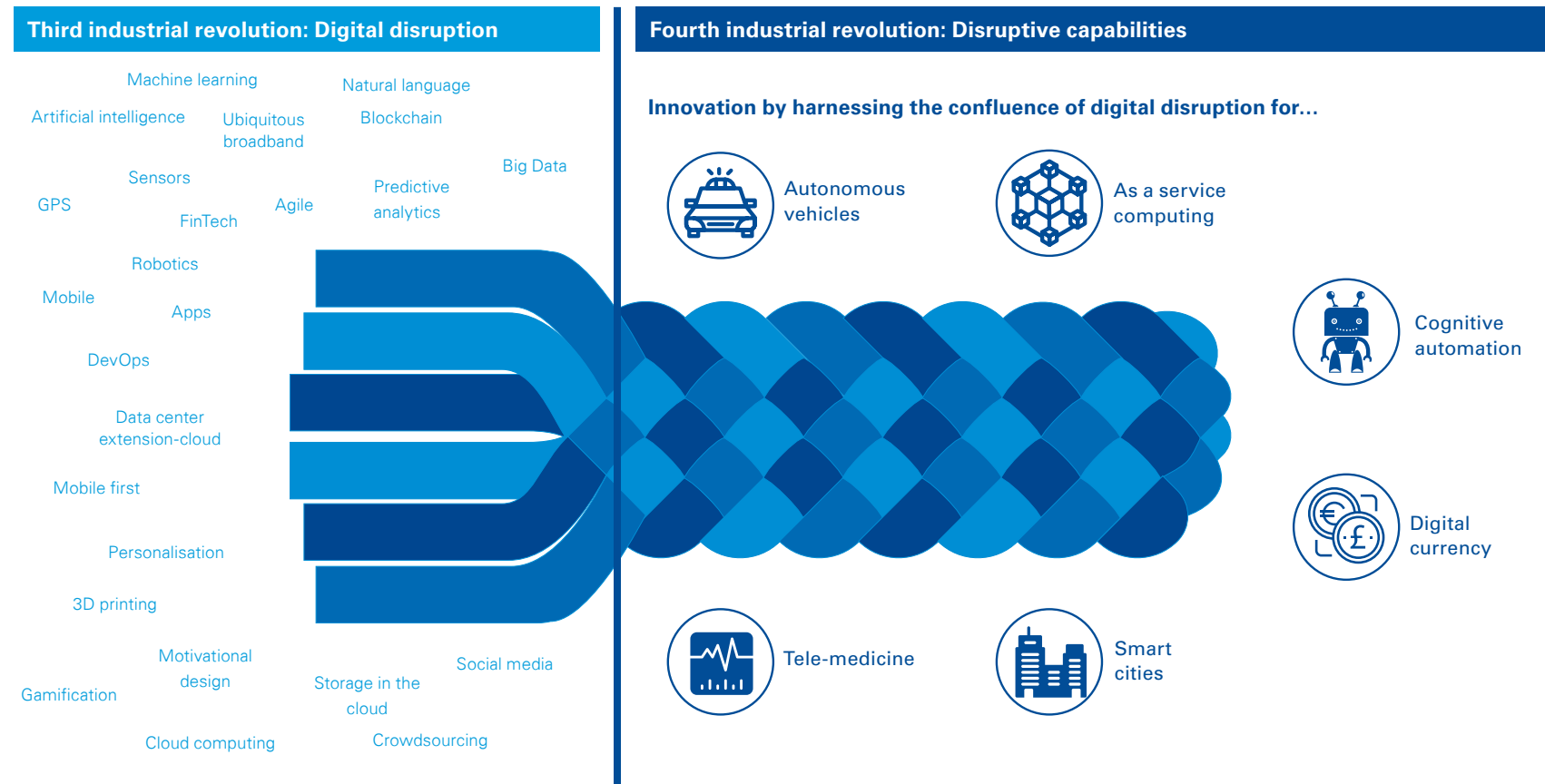
## Disruptive Technologies

What makes this different is that in the past it has been single technologies that have led to major changes in the way people use computers: the minicomputer in the 1970s, the PC in the 1980s and the Internet in the 1990s. Today it is not one, two, or even three technologies but a wave of technologies and these individual technologies can be combined in ways that increase their disruptive power (see figure 1). As they mature prices typically fall, experience is gained and more opportunities are discovered, leading to further disruption. This cycle of technology emergence, adoption, and innovation has never been seen at this pace and scale. Most importantly, they are not just changing the way people use computers but the way that people, businesses, and governments engage and create value.

<sup>2</sup> CNBC has been tracking and publishing a list of the top 50 disruptors for the past four years. You can see the most recent list here: <http://www.cnbc.com/2016/06/07/2016-cnbc-disruptor-50.html>

<sup>3</sup> Klaus Schwab, founder and executive chairman of the World Economic Forum, has written a book about it – "The Fourth Industrial Revolution", World Economic Forum, 2016.

Figure 1: Disruptive technologies catalyze the fourth industrial revolution



The big four disruptive technologies known as SMAC - social media, mobile, analytics & data, and cloud - are maturing and being joined by newer ones like the Internet of Things (IoT), while advances in artificial intelligence are enabling breakthroughs in robotic process automation (RPA) and cognitive automation (CA). Taken together they are disrupting business models, organizations and even entire industries. They enable startup companies to quickly innovate with a limited amount of capital and scale rapidly when needed. The irony is that established companies are finding that their enormous investments in legacy information systems and scale, that used to provide them with competitive advantage, are now barriers that prevent them from responding to disruption at pace.

In addition there are other emerging technologies that have not yet matured or combined to the point where they can be called "big bets" but bear watching. Some of these would include 3D printing that could revolutionize manufacturing, blockchain - the underlying technology for digital currencies that could disrupt the entire payment ecosystem - not to mention other applications, and virtual reality to name a few.

# Six big bets

All is not lost. There are many examples of large, established enterprises that have embraced disruption and used these same technologies to drive innovation and compete effectively against both traditional competitors and new entrants. There are a number of ways that companies can choose to remain competitive including being fast followers (leaving the bleeding edge to others), incremental innovation (improving existing products), pursuing adjacencies (in products, markets, or capabilities), or “big bang” innovation (sharing economy).

**Whatever competitive strategy a company pursues it is important to understand the common characteristics of digital disruption...**



#### Speed

disruption happens quickly and with little warning. Disruptors quickly develop and introduce new business models, products and services and test them in the market, constantly adapting to real-time feedback and failing fast when wrong



#### Scale

by taking advantage of the cloud they can scale their successes quickly without the need for capital or significant additional resources



#### Surprise

disruption can occur at any time and from anywhere. It can come from established competitors, companies in adjacent markets, or from garage-based startups



#### Continuous improvement

once something works it is constantly enhanced through the addition of incremental capabilities and value making it a constant moving target for competitors

**CIOs can lead their organizations through digital transformation but time is running out.**

KPMG member firms have identified **6** key initiatives or “big bets” that CIOs need to make now to enable their organizations to both defend against disruption and become disruptors themselves.

# bet **1** Journey to the Cloud

Of all the disruptive technologies, cloud in all its forms has had the biggest impact and provides the foundation for most of the other technologies and their ability to disrupt. The availability of very low-cost, on-demand, and easily provisioned infrastructure as a service (IaaS) has all but made obsolete the need for many organizations to build and operate their own datacenters. Meanwhile, the growing portfolio of application software as a service (SaaS) has enabled business organizations to directly procure solutions with little or no assistance from IT, eliminating the need for upfront capital and reducing the lag time from decision to value from months or years to weeks or days. The recent Harvey Nash/KPMG CIO Survey confirmed this journey to the cloud with the vast majority of respondents planning to make significant investments in cloud services. Over the next 1 – 3 years, large organizations (IT budgets greater than \$250 million), respond that 58% will make significant investments in IaaS, 56% will make significant investments in platform as a service (PaaS), and 64% will make significant investments in SaaS. Of the three, PaaS investments will grow the fastest, with a 78% jump expected (see figure 2.1).

As the market for cloud services has matured, it is being deployed well beyond serving as a utility for storage and servers. Applying a cloud-first strategy has many compelling advantages not the least of which is freeing IT from the heavy burden of building and operating datacenters. This significantly reduces IT's constant need for capital that can now be deployed elsewhere and eliminates the need for a large operations staff. Furthermore, with the appropriate governance processes in place, favoring SaaS solutions over internally developed ones helps the business become more self-sufficient, reducing demand and freeing up additional resources to work on more complex and high value initiatives.

The survey also revealed that to respond to digital disruption, large organizations are increasingly turning to cloud services to improve agility and responsiveness and accelerate product development/innovation. Saving money, while an important driver, was only the third most favored answer (see figure 2.2). There may still be certain situations where putting applications or data in the cloud is not an option, including concerns around cross-border data flows, privacy and security, but reasons for such exceptions are being addressed and eliminated at a rapid rate. The big cloud service providers are rapidly building out their geographic footprints so that they can respond to requirements to keep data within country borders and are making significant investments in securing their networks and datacenters. Most of the major data breaches to date have been to private sector and government organizations in their data centers, not public cloud providers<sup>4</sup>.

<sup>4</sup> For a comprehensive list of data breaches see: <http://www.informationisbeautiful.net/visualizations/worlds-biggest-data-breaches-hacks/>

Figure 2: Cloud Services Investment and Adoption Trends

Figure 2.1: How do you expect to invest in cloud services in the next 1-3 years?

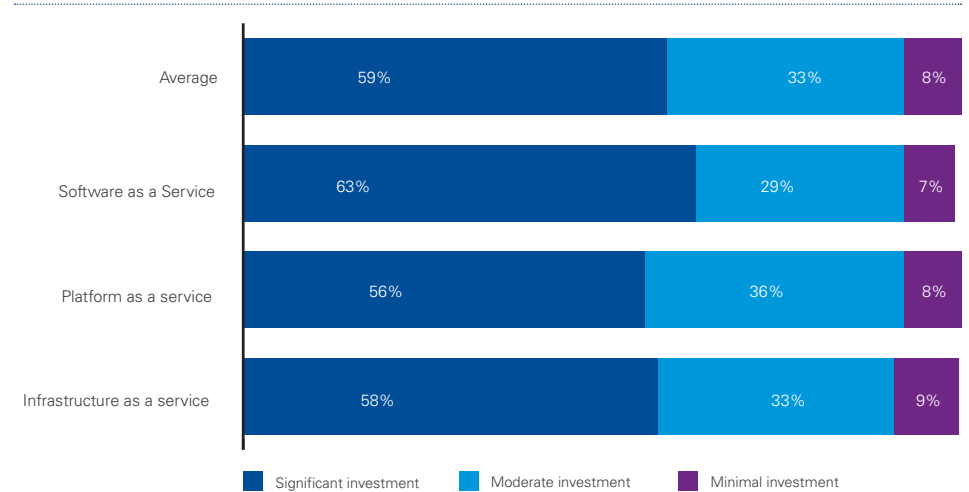
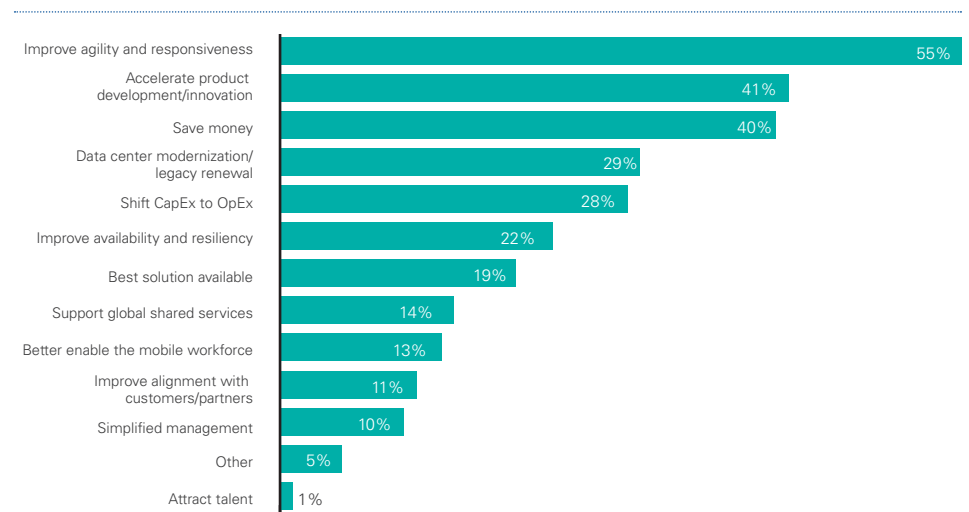


Figure 2.2: What are your top three reasons for using cloud technology?



## bet 2 Digital Labor



The current global market for IT spending is about US\$3.5 trillion yet except for the vendors on the receiving end of this largesse, economists are asking why all of that technical wizardry “seems to have so little impact on the economy.”<sup>5</sup> But be careful what you wish for. The availability of ubiquitous, cheap computing (cloud) coupled with advances in machine intelligence are driving innovation around robotic process automation (RPA) and cognitive automation (CA) leading to the emergence of digital labor as a viable alternative. KPMG defines digital labor as “the automation of labor by leveraging digital technologies to augment, or automate the tasks undertaken by knowledge workers in your business.”<sup>6</sup> According to Forrester, automation will displace 22.7 million jobs by 2025,<sup>7</sup> and leading organizations are already reaping the benefits from early deployments of RPA-based solutions and gaining competitive advantage as a result.

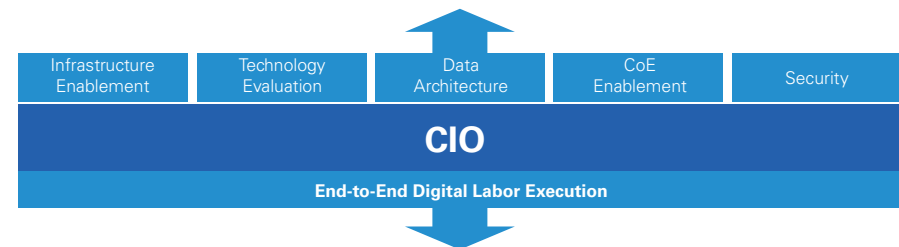
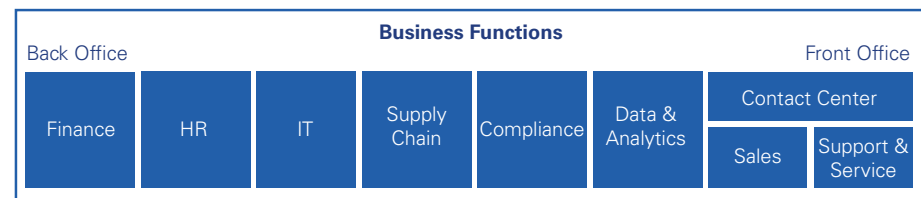
The disruptive impact of digital labor could be enormous. One group already feeling the impact is offshore service providers that perform knowledge services. They are already experiencing shrinking growth and are beginning to introduce cognitive platforms as an alternative to people. Digital labor’s impact will be significant but it won’t happen at once. Digital labor is comprised of a number of technologies that are at different states of maturity and will evolve at different rates. As a result the impact will occur over a number of years and in multiple stages. Initially, the focus will be on replacing low-level jobs that perform repetitive tasks following a set of static rules, the kind of work that has been off-shored in recent years. This includes call centers, claims processing, order entry, and testing. Eventually this will evolve into solutions that can process unstructured data and knowledge bases and apply analytics to discover patterns and trends, and perform speech and video tagging. Eventually, cognitive automation will result in solutions capable of learning and adapting based on experience and context, and impact knowledge worker roles.

At least initially, these types of solutions are more likely to augment existing roles rather than replacing people, for example by helping doctors make faster and more accurate diagnoses by reading a patient’s history, analyzing sensor-driven vital signs, and accessing all of the most current knowledge on a global basis - all within a few seconds. While many of these use cases lie in the distant future, early adopters are generating tangible ROIs from their efforts.

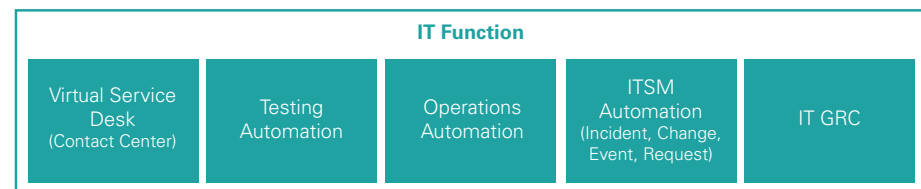
For CIOs there are two roles to play: technology leader to enable business automation, and IT functional leader to automate IT delivery (see figure 3). For example, on the business side there are opportunities where there are large pools of resources performing routine or manual tasks like order entry. Likewise, within IT there are many opportunities to use RPA including creating a virtual service desk to respond to routine requests, automating testing in support of continuous delivery, automating operations, and automating IT service management. CIOs should or are likely to already have a number of these initiatives underway. This is likely to deliver cost savings and efficiencies to IT while at the same time provide a valuable learning experience and establishing IT’s credibility.

Figure 3: Digital Labor – Two Leadership Roles for the CIO

### 1 As Technology Leader – Enable Business Automation



### 2 As IT Functional Leader – Automate IT Delivery



<sup>5</sup> Why The Economic Payoff From Technology Is So Elusive”, New York Times, 6/6/2016.

<sup>6</sup> Demystifying Digital Labor, KPMG Institute, June 2016, <http://www.kpmg-institutes.com/institutes/advisory-institute/articles/2016/06/demistifying-digital-labor.html>

<sup>7</sup> The Future of Jobs, 2025: Working Side by Side with Robots”, Forrester Research, August 24, 2015.

## bet **3** Omnichannel Consumer Experience



The digital transformation of business now well underway has caused a major shift in the balance of power in most markets. According to Jim Blasingame this is the “age of the customer”.<sup>8</sup> Empowered customers with higher expectations now have instant access to product information, professional reviews, and other customer experiences. When someone has a bad experience it immediately gets posted on social media for all to read.

Customers are now in control of their interactions with brands, and businesses must create compelling customer experiences across all of their channels and touchpoints. The explosion in mobile devices has led to complex customer journeys where a transaction might start with research done in front of a computer, order placement from a smartphone, and pickup at an actual store. To remain competitive, businesses must re-design the customer experience to meet higher customer expectations by providing a seamless experience regardless of channel or device: they must provide an omnichannel consumer experience.

This is not limited to customers. Many customers are often also employees and bring their “consumer experiences” and same set of raised expectations to the workplace. They want the ability to access company data at any time, any place and from any device. They want to engage with their employer using social media and apps. To deliver on these ever-increasing consumer, worker, and ecosystem expectations for a true omnichannel experience, organizations must take a holistic approach, addressing each of eight key enablers (see Figure 4).

For example, a large specialty retailer recognized that at least 43% of customers have used their mobile phone while shopping in a brick-and-mortar store. Their initiative provides up-to-date and accurate product information and inventory status at every turn across all of its many shopping touchpoints. When a registered shopper enters one of its stores it sends them an email with in-store offers and coupons based on their prior purchase and browsing history.

The preceding example illustrates that maximizing the return on customer-facing investments comes when they are tightly integrated with the “back-office” transaction systems of record to provide a seamless customer experience. The challenge for CIOs is to re-architect the legacy transaction systems to provide easier and faster integration with newly developed omnichannel initiatives.

Figure 4: The Omnichannel Consumer Experience – 8 Critical Success Factors



<sup>8</sup> Jim Blasingame, *The Age of the Customer*, (Florence, AL: SBN Publishing, 2014)



## bet 4 Internet of Services



Low cost sensors and microprocessors linked to the internet have led to the emergence of the internet of things (IoT) with over 50 billion connected devices expected by 2020 according to Cisco. Our fourth bet is labeled the internet of services (IoS) to emphasize the significant opportunities to drive value and monetize the IoT by building services based on capturing, organizing, integrating, and analyzing the huge volume of data it produces. One of the most exciting is transforming products into services creating consistent, long-term revenue streams. Almost any tangible product is a candidate to become a service. IDC has forecast that 40% of Top 100 discrete manufacturers and 20% of Top 100 process manufacturers will provide product as a service platforms.<sup>9</sup> Benefits of this 'anything as a service' (XaaS) include:



### New business models

Rather than a one-time transaction with a large, single payment, a service is a long-term, consistent revenue stream that can be invoiced based on time, e.g. monthly, or it can be invoiced based on usage or any other way in which it can be measured. For example, software vendors have been moving from a one-time license model to an as a service model for some time, charging by the number of users typically on a monthly basis, while cloud-based services can be instantly available and scale quickly.

Examples include selling jet engines based on hours used as opposed to one-time purchases. The benefits extend beyond smoothing out the payment stream. The engines can be monitored in real-time and preventive maintenance performed prior to a failure. Furthermore the constant stream of data can be used to provide feedback that can be used to optimize performance.



### Increased Revenue

IoT as a service can increase revenue, and, in the case of agriculture, also reduce the cost of compliance with food standards and demonstrate food safety and provenance.

For example, The Yield in Australia is an IoT AgTech product company working with oyster farmers to reduce the number of harvesting closure days. Barilla Bay Oysters in Tasmania is a major producer of oysters with over 100 hectares in oyster leases. They are fully integrated with a processing plant for frozen half-shells, a restaurant, a shop and a tourist centre. Oysters are a live product that command a premium price. Live oysters from Australia return ten times a tonne more than cooked oysters from

China. There is a big market potential in Asia with growers reporting up to 600 per cent margins for exported oysters. Oyster sales rely on Australia's reputation for excellent food safety standards. Oysters are filter animals. When it rains, oysters accumulate toxins from land run-off. Based on data from the nearest weather station, the regulator then closes oyster farms temporarily to protect human health. Each closure can cost growers like Barilla Bay Oysters between \$20,000 to \$100,000 a day; with costs nationally around \$34 million annually. Analysis indicates closures can be reduced by at least 30% using real-time salinity IoT sensors.<sup>10</sup>



### Improved customer experience

Since a service is constantly collecting and sending data, it can be used to adapt and tune the service based on the customer's usage, even suggesting different and better ways to use the service. It extends customer engagement beyond a one-time purchase to a long term relationship.

For example, a large agricultural manufacturing company has added significant value to their sensor enabled farm equipment through their Agricultural Management Solutions. One solution helps farmers plan their operations ahead of time, even prescribing application rates that take into account the soil nutrient map or yield map produced from the data it collects in the fields.



### Increased efficiency and reduced costs

Data streams give organizations visibility into the physical world to monitor machine performance, detect problems, and alert service personnel to perform preventive maintenance before outages occur. For products like appliances it can significantly reduce the number of service calls and time. For example, rather than having to send out a service technician to diagnose the problem, order any parts, and then return a second time to fix the problem, they will be dispatched the first time already knowing what the problem is and with the correct part.

One of the largest manufacturers of elevators has connected 300,000 of its elevators with a technology called Remote Elevator Monitoring (REM) that collects information about how far the elevators travel and any malfunctions. This data is used to create models to predict future failures and send a technician to fix a problem that may not be evident yet.<sup>11</sup>

The bottom line is that almost every industry can leverage the IoT to provide bundled value-added services to existing products to create more "sticky" relationships, but this will require integration and enhancements with existing systems of record. CIOs will need to ensure that they have access to data and analytics skills, as well as networking and security.

<sup>9</sup> IDC FutureScape: Worldwide Manufacturing Product and Service Innovation 2015 Predictions, IDC, 2014.

<sup>10</sup> <http://www.foodagility.com/>

<sup>11</sup> Otis Elevator looking to IoT, digital transformation to provide a business lift", Network World, May 31, 2016, <http://www.networkworld.com/article/3076849/internet-of-things/otis-elevator-looking-to-iot-digital-transformation-to-provide-a-business-lift.html>

## bet 5 Continuous Delivery



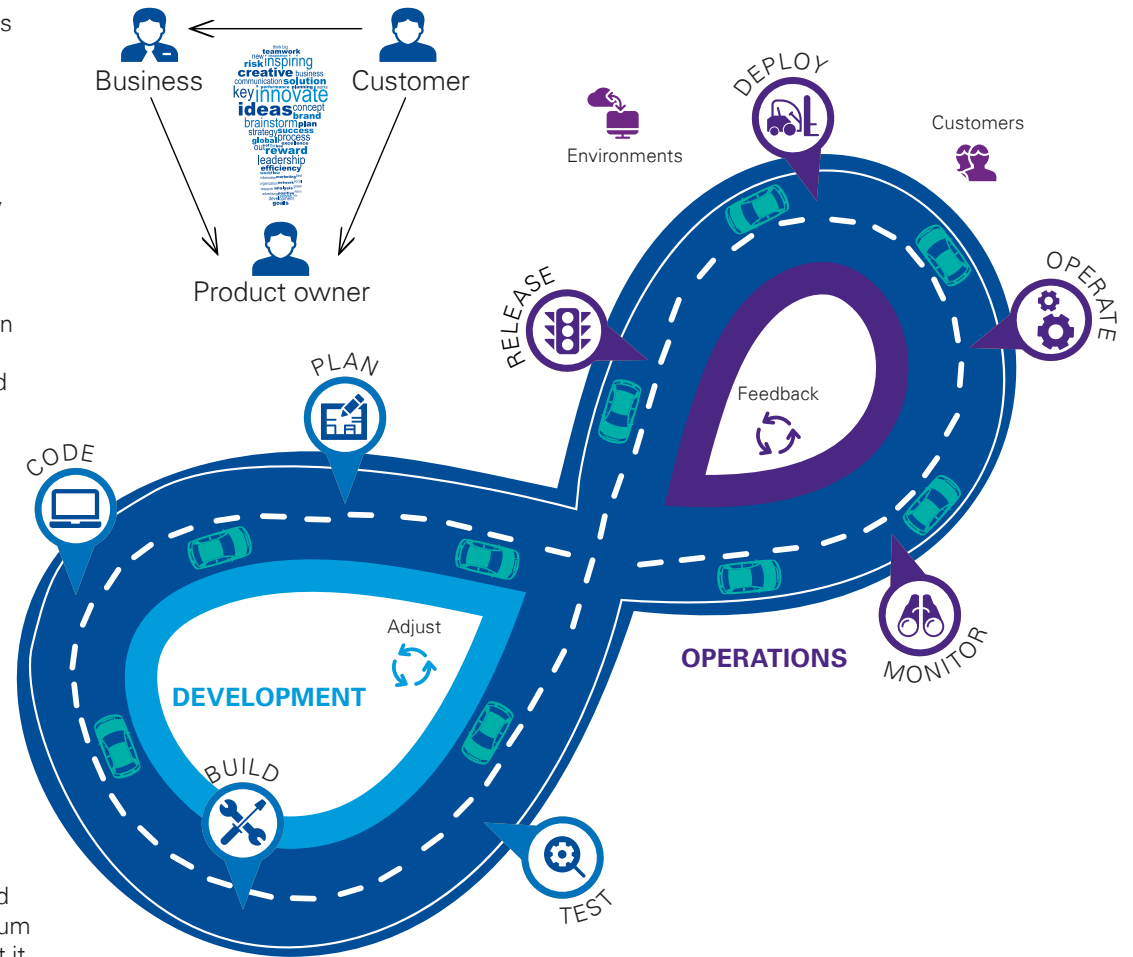
The fifth big bet is aimed at providing organizations with the capability to deliver technology-enabled business value on a continuous basis. Rather than “big bang” releases of new applications or major upgrades to existing applications, continuous delivery is designed to get changes of all types into production quickly with high quality and reduced risks. In fact, increasing speed does not mean lower quality and increased risks. Research has demonstrated that high-performing IT teams deploy code 30 times more frequently than their peers with 60% fewer failed deployments.<sup>12</sup>

To keep up with the pace of change the IT function must radically change the way it creates and delivers value to its stakeholders. Large enterprises responding to the Harvey Nash / KPMG CIO Survey reported that they were implementing agile methodologies (74%) and DevOps (42%) to become more agile and responsive in the development and delivery of IT services.<sup>13</sup> Continuous delivery builds on lean IT, agile methodologies and DevOps, integrating people and processes through automation focused on increasing collaboration across business, development and operations to enable faster, reliable and more frequent deployments to market. It is not unusual for teams employing continuous delivery to release new functionality multiple times per day! A continuous delivery lifecycle is depicted in Figure 5.

Continuous delivery consists of five principles: (1) quality is built in via frequent automated tests and feedback loops; (2) work is done in small batches to get immediate feedback and reduce the cost of failure; (3) provisioning, testing and quality assurance (QA) is automated to the greatest extent possible to speed the process and reduce human error; (4) continuous improvement is a constant focus; with (5) responsibility is shared by everyone and metrics focusing on customer satisfaction and outcomes.<sup>14</sup>

For CIOs, continuous delivery is both a good news and bad news story. The bad news is that it requires a complete cultural change across all of IT and the business participating in the development process. This includes development and operations including new roles, new skills, and new measures of performance and success. The good news is that it doesn't have to happen all at once. Continuous delivery can be introduced on a project basis and expanded over time, building on success. If done properly, it will eventually pick up momentum and visibility as more people want to be part of it since experience has shown that it empowers teams, provides more flexibility, and lowers stress which leads to happier and more motivated employees.

Figure 5: The continuous delivery lifecycle



<sup>12</sup> 2015 State of DevOps Report, puppet labs, <https://puppet.com/resources/white-paper/2015-state-of-devops-report>

<sup>13</sup> Harvey Nash / KPMG 2016 CIO Survey

<sup>14</sup> Humble, Jez. "What is Continuous Delivery?". Web blog post. Continuous Delivery, Feb. 1, 2010.

# bet 6 Next Gen IT Operating Model

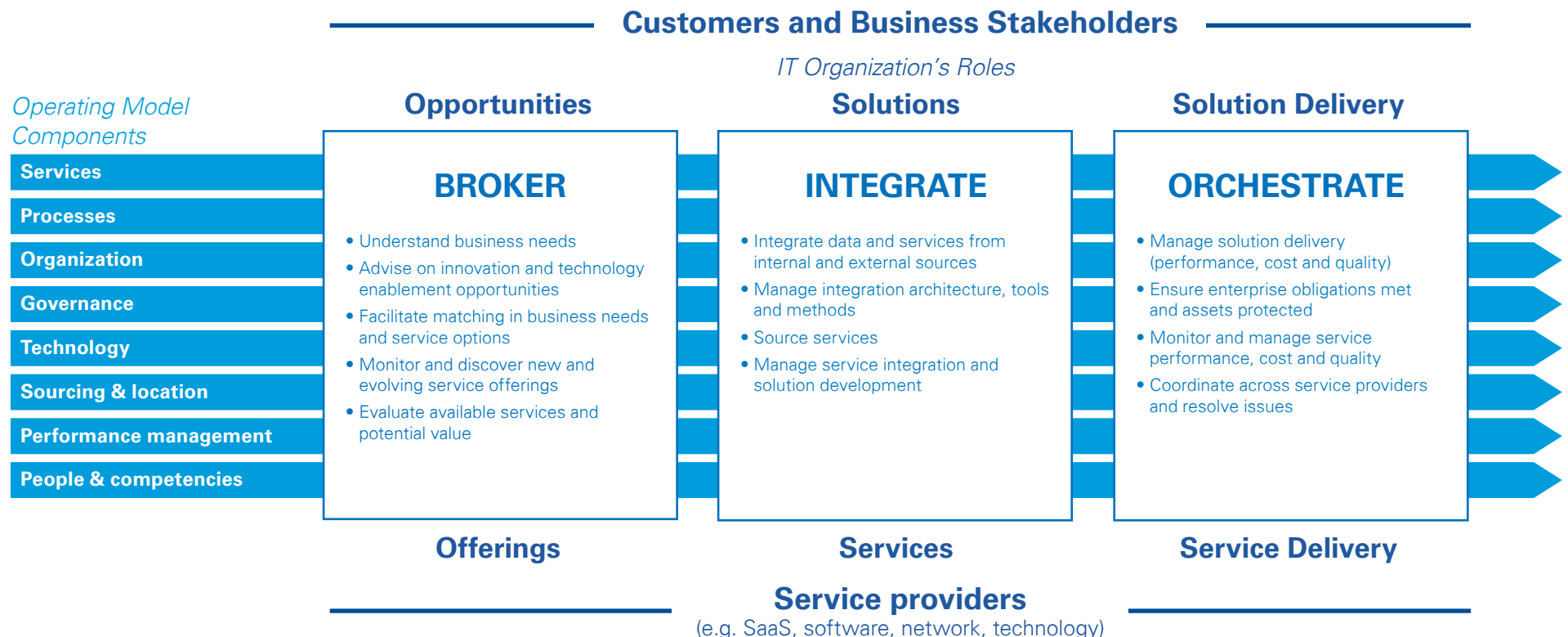


Putting infrastructure in the cloud, delivering multiple new releases daily, deploying digital labor, creating an omnichannel consumer experience and building product as a service business models all require vast amounts of technology enablement. The IT function's typical operating model--plan, build, run-- is obsolete in this context. It cannot adapt quickly enough to meet emerging needs. That's why our sixth bet is

about a next generation IT operating model. IT value no longer comes from building, operating, and owning assets (datacenters and applications) and completing milestones and tasks. Rather, IT value comes directly from providing services and capabilities in order to enable business outcomes. This requires IT to meet demands for innovation, flexibility, and faster delivery cycles, and puts the emphasis on leveraging emerging technologies and sourcing alternatives as well as integrating them with existing legacy applications and data.

The new operating model builds capabilities to multi-source, integrate, deliver, and manage services to respond to these new challenges. The focus becomes one of sourcing IT-enabled services and capabilities that deliver high quality and optimal business value at competitive costs. The next generation IT operating model encompasses three new roles for IT: broker, integrate, and orchestrate (see Figure 6).<sup>15</sup>

Figure 6: Next generation IT operating model



<sup>15</sup> For more information, see the report Next-gen IT Operating Model, KPMG Institutes, <http://www.kpmg-institutes.com/institutes/advisory-institute/articles/2014/01/next-generation-it-operating-models.html>

In this new operating model, IT functions as a service broker bringing buyers, i.e. customers and stakeholders, together with providers, i.e. service providers, to solve a business problem. IT will bring its knowledge of the market, technologies, and vendors together with its deep understanding of stakeholder needs to help the business select the right solution and also to pro-actively bring IT-enabled innovation opportunities to their attention.

As IT brokers solutions from multiple sources, its focus shifts from building to integrating. Whether internally or externally sourced, services will need to be integrated with each other and with existing data and services to make them fully functional. This is increasingly important as disruptive innovation is predominantly focused on customer-facing solutions. However, realizing value from these investments typically involves integration with back-office systems of record. Additional important points of integration include architectural integrity, identity and access management, security, legal and regulatory compliance, disaster recovery and business continuity compliance to name a few.

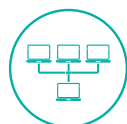
In a world where services and capabilities are multi-sourced and integrated with existing services and data, the resulting solutions become complex. IT's responsibility changes from just delivering services to the end-to-end management and performance of services. In its third role, IT orchestrates the delivery of services and ensures that performance, cost, and quality are meeting or exceeding expectations and the business is getting maximum value. The goal is to make this complexity invisible to the business.

Getting to this next gen operating model is a massive but necessary change initiative requiring a new culture, new roles and new skills, and it will take years to become fully realized.

# Next steps

Making these bets requires significant focus and commitment as well as a solid core foundation within IT. Each of these bets needs to be evaluated in terms of their relevancy and potential benefits. Furthermore, the technologies underpinning them have different levels of maturity that must be taken into account. KPMG member firms recommend prioritizing them based on a combination of anticipated level of effort, size and timing of the benefits, and the overall likelihood of success given your organization's skills and capabilities.

In conducting this evaluation it is worth considering the following recommended next steps:



## Streamline and rationalize legacy systems

Almost every established organization has a significant investment in infrastructure and a portfolio of complex, inflexible legacy applications with a large technical debt that constrains innovation and limits investment in new capabilities, especially if they represent significant balance sheet assets. A good first step is to do a thorough review of the applications portfolio and eliminate any redundancies and low value systems. The second step would be to re-architect and develop a set of standard APIs (Application Programme Interfaces) to the core systems of record to make future integrations faster with reduced risk. Follow this with a third step of migrating as many remaining systems as possible to the cloud. Recently a major global healthcare company said that it is aiming to have 85% of its applications in the cloud by 2018 - this from a company in a heavy regulated industry.



## Adopt agile processes with the business

Slow development processes and methodologies designed to develop large programs spread out over months or years are the antithesis of what it takes to compete in the digital business world. Furthermore, they have contributed to a large backlog of existing projects that could consume all available resources. The first step is to work with the business leadership to review the existing program and project portfolios to eliminate anything that is not critical and does not contribute to digital transformation. At the same time, work with partners to develop and acquire agile skills and select and task a team to pilot continuous delivery with a potential high



value project.

## Build digital skills and behaviors

Digital business transformation requires many new skills, ranging from customer-centric skills to data and analytics. People within IT need to understand business processes, value chains, and customer journeys and be able to link this to technology-enabled solutions. A number of these skills won't be found in existing IT organizations. A number of IT organizations have had success recruiting from the business ranks while at the same time using job rotations to move people from IT into the business and vice versa. Developing partnerships with digital consultants is another way to acquire much needed digital skills. A few organizations have even acquired small software companies specifically for their skills and culture.



## Convey urgency and pace

Digital business is about speed. Product lifecycles are compressed and markets can be disrupted overnight while at the same time the regulatory environment is in flux. This contrasts sharply with the traditional IT culture which is typically slow, methodical, and risk averse. CIOs must change the metrics and incentives to encourage experimentation and convey a sense of urgency.



## Align the Board and C-suite around a digital vision

Regulatory requirements with respect to digital continue to evolve, making it difficult to comply and sometimes slowing or halting innovation. This is especially true when it comes to privacy and data concerns. Gaining consensus on digital strategy and ownership remains a challenge as IT and business units vie for control. Getting funding and resources to invest in innovation and emerging technologies can prove difficult if the Board and C-suite aren't fully committed. CIOs need to work closely with the Board and fellow C-suite executives to help them understand these issues while at the same time articulating a clear digital vision and strategy.

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