Mastering the Digital Economy
By Paul Roehrig & Benjamin Pring

The Center for the Future of Work
The Work Ahead is a research series providing insight and guidance on how business – and jobs – must evolve in an economy of algorithms, automation and AI.

With new machines and new business models based on information, the rules of the game are being rewritten. In this, the first of our series, we outline the economics top trends and tactics for success related to the future of your work.

A new economy – a digital economy – is emerging from the red hot furnace of technological innovation. An economy based on platforms and algorithms and “things” and “bots” is taking shape and in the process generating huge new money from ideas that represent the future.

At the heart of this digital economy are changes in work. The work that got us to the present won’t get us to the future because the digital economy requires completely different skill sets and attitudes, as well as greater expectations.

In order to understand the changing nature of work, the changing nature of commerce, and the changing characteristics of success in this brave new world, Cognizant’s Center for the Future of Work – in conjunction with the renowned economist Nouriel Roubini – surveyed top executives at leading companies around the world to gain insight into how the future of work is already coming to life today. We also interviewed MBA students to get a point of view from our next generation of leaders. To add more perspective to the major trends and dynamics that matter, we spoke with 50 leading “futurists,” people whose day job it is to see around corners and tell us where gold (and mines) are buried. (For more on our research method, please see Methods and Demographics, page 36.)

Five key themes emerged from our research and analysis:

01
Though we may think we understand the “digital” revolution, its scope, scale and importance are set to surprise us all – we ain’t seen nothing yet!

02
The economics of digital are an unstoppable force. In our “new normal” world, the Republic of Digital is the state you want to be in.

03
Artificial intelligence is real business. AI has left the laboratory (and/or movie lot) and is in your building.

04
The digital “dark side” is real but manageable. Pessimism and denial are not good business models; the spoils will go to those who take the (managed) risk.

05
Business leaders may be sitting on untapped cost savings that can be mined with our new machines.

Though nearly everyone in the workforce today has lived their entire life in the “information age” the dawn of true digital business is just breaking. In The Work Ahead, we provide unprecedented, unique insight into the future of your work – insight that should be key to re-imagining the strategy, tactics and operations of your work, your organization, and your fresh ideas.
The impact of new technologies on all aspects of business — what we’re now calling “digital” — is so large that there is no way for any of us to escape its gravitational pull. Even if you are one of the few who think this is all still hype, if you’re set on denying the real value of code, your defensive barricade will not hold for much longer.

The economic data shows that new fortunes will be built, and others will recede, because how we work to create value is evolving. Many elements of “business as usual” will switch from being rules for success to career threats. Our collective work ahead will be to thrive in this new business context.

Anyone paying attention will undoubtedly have seen plenty of Big Scary Numbers related to the digital shift. We’ll first set the context with our broader economic findings. We believe this will offer a sense of scope of the true opportunity (and risk). But don’t worry, very quickly we will deconstruct those numbers into tactical guidance and meaningful steps you can take tomorrow.

We studied 2,000 companies from across the globe — with a combined total revenue of about $7.3 trillion during the past year — and found that business leaders are already feeling the ground shifting beneath their feet due to the power of new technologies. Approximately 6% of that revenue was driven by digital, but so was an increase in costs. The net effect was 4.6% of revenues. On a percentage basis this may sound small, but it translates into roughly $364 billion. That’s a bit more than the change that’s fallen into the couch cushions.

Business leaders feel strongly that their companies are leaving money — lots — on the table. Over the next year, leaders believe they could unlock an additional $151.6 billion in revenue value if they took full advantage of digital. (That’s an average impact of $75.7 million per studied company.) We’ll deal with the cost impact later, but the full size of the revenue opportunity has come into focus. Executives expect the total potential revenue impact to more than double between 2015 and 2018 to 11.4% of total revenue, unlocking value of about $770 billion per year. (For those keeping score, that’s a total economic impact of about $2.3 trillion projected by 2018 across all companies studied.)
so do we have your attention now?  

1 With apologies to Simon Pegg, who wrote the zombie-themed romantic comedy Shaun of the Dead, from which this line is derived.  

The Economics of Digits
(Part 2: The Whole World)

If you’re hoping to head out for a nice cold pint and wait for all this to blow over, we’ve got some bad news for you. No company will be able to escape from the impact of new technologies on work and business. The impact will change how we conduct not only business but also education and government, and it will also redefine what it means to be a healthy society.

Economists from Roubini ThoughtLab (a leading independent macroeconomic research firm founded by renowned economist Nouriel Roubini) extrapolated our study results across the surveyed industries – retail, banking, insurance (health and P&C), manufacturing and life sciences – which collectively generate over $60 trillion in revenue today (roughly the scale of about 40% of world GDP). The analysis revealed that the impact of digital transformation on these industries between 2015 and 2018 alone could be up to $20 trillion. To put this in perspective, this means the Republic of Digital, if it existed as a separate country with a $6.6 trillion economy, would be the third largest economy in the world (roughly equal to the economic horsepower of the entire 2015-economies of Germany, the UK and Austria, combined).

At a company level, digital will increase revenues on average by over 10%, which means digital will touch every aspect of a company’s strategy and operations.
Given all this, and given that so much could be done, what are some of the key things that must be done? Here are two approaches we believe will produce tangible results.

Learn your history of work.
As important as it is to communicate excitement and enthusiasm for the “new,” it is just as crucial to relegate irrelevant activities to the “Museum of Work.” Given that most organizations — and probably yours — tend to increase budgets and headcounts in incremental, single-digit-percentage ways, an important element of being able to do new things is stopping old things. While often overlooked, adding without subtracting always ends in chaos, stress and recrimination. Within the team, department, business unit or organization for which you’re responsible, craft a plan that clearly delineates the activities — initiatives, projects, work streams — that you won’t be doing this time next year. This will send a signal that you’re not simply paying lip service to the idea of innovation but that it is a core tenet of the work ahead.

Rinse and repeat.
Moving into the future of work is not a one-and-done exercise. Given the incredible pace of change at the moment — let’s be honest, had you even heard of blockchain 12 months ago? — executives need to maintain a steady stream of action focused on seizing new opportunities. An important element of this reinforcement activity is finding new ways of making the message stick. Issuing a steady drumbeat of same-sounding calls to action will result in diminishing returns. Instead, leverage varied and unpredictable channels — e.g., video one quarter, an infographic the next — to convey important digital messages, tactics, strategies and initiatives to the appropriate audiences. Don’t forget to vary the points of attack, whether it’s a customer issue in one communiqué and a competitor issue in another, for instance.

Digital Message Received, Loud and Clear
One overriding theme from our data is that people “get” that digital transformation is a big deal (see Figure 3). Though “debates about the rate” (i.e., the rate of change) will continue to flare up from time to time, there seems little doubt in the minds of our respondents that digital transformation is strategically important to their corporate, and personal, fortunes in the immediate future. All the discussion about digital has obviously made an impact. Almost two-thirds of respondents clearly see the importance of digital transformation. The other third? Perhaps they missed the memo, or haven’t read a newspaper or a magazine — remember those? — in the last five years. Or they are in denial, hoping to retire or win the lottery before the wave hits them.

**Importance of Transformation**
Digital transformation is strategically important to the 2,000 global executives surveyed.

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<th>Importance Level</th>
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<td>Very Important</td>
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A more charitable possibility is that these leaders were “born digital.” They see no need to transform because digital is just the norm. Considering the vast amount of money that has been spent on marketing digital-related products and services throughout the last few years, this broad consensus — that digital is no longer simply theory — might not surprise you. What is eye-opening, though, is that in our travels we still frequently come across “digital deniers” (typically sitting in the back of the conference room where we’re presenting). Their voices of skepticism, however, appear to be muted within our study findings. It seems that even those with doubts, when pressed in private, concede that something real is happening, and that inaction would be a career-limiting strategy when the future is at stake.

**Figure 3**
Source: Cognizant Center for the Future of Work, 2016

Don’t Just Say Hello; Say Goodbye. Frequently.
‘Always Be Closing’
Digital Is Helping Leaders Write a New Chapter in the Story of Revenue.

The amount of revenue derived from digital channels is set to mushroom over the next few years. Although our data could suggest that the non-digital world will still predominate in that timeframe, such a conclusion would miss the nature of the change that is unfolding. Digitalization has something in common with Ernest Hemingway’s description of bankruptcy: It occurs “gradually, then suddenly.” On the route to digitization, many industries are approaching their “suddenly” moment.

Digital will increasingly be the channel through which organizations make money. It is the next chapter in the “story of revenue.” By 2018 digital will – on average across all industries studied – influence more than 11% of all revenue, up from 4.6% currently (see Figure 4). This represents, if not exponential growth, a significant quickening of the shift to digital. In gross revenue terms, this equates to $2 trillion across the organizations we surveyed. Hardly chump change.

While the revenue change will vary by industry, all sectors will be impacted significantly. The trend is most pronounced in retail, where it’s a matter of life or death to excel in the digital customer interface. Even in life sciences – the least digital industry we studied – the uptick is material. While it may have been credible to argue that digital transformation was an issue for some businesses in the industry we studied – the uptick is material. While it may have been credible to argue that digital transformation was an issue for some businesses in the retail, financial services, life sciences, and healthcare industries in the past, that’s no longer a sustainable point of view. This is everybody’s business nowadays.

Learn to Play and Win the New Game
Digital is the future of money for business. And given that money matters immensely for organizations of all types (even non-profits need to pay the utilities bill), everything your company does will be impacted by this shift. This kind of transition is a winner-take-most dynamic. If you’re not in the top of your category in the digital age, get ready for your current revenue river to shrink to a minor stream.

These are – like it or not – the new rules of the game. Play them, win with them. If not, trouble awaits. The following approaches can increase your chances of winning:

- Focus on the customer experience. The digital consumer or process constituent (ecosystem suppliers, partners, etc.).
- Make the digital experience part of your business model.
- Don’t optimize fading business models.

At an overall organizational level, the transition to digital has dramatic strategy implications. You and your teams need to ask, “Do we have the right business model and the right technology model to compete in our industry going forward?” As recently as five years ago, these questions tended to be asked once a year at the annual senior executive offsite at a nice golf resort. Now, they are – or should be – asked every day in the unglamorous offices where the “real work” is done. More and more executives and line managers understand that optimizing an obsolete product, service, business strategy or process is a recipe for irrelevance.

Optimize every moment.

At the line-of-business level, this means tuning – and fine-tuning – your products and services for the digital consumer or process constituent (ecosystem suppliers, partners, etc.). It means recognizing that every digital moment is a moment of truth. If you offer a sub-standard website, mobile app, call center or in-store experience, you are leaving money on the table (or screen) that one of your competitors will pick up. It means building digital experiences that are engaging, long-term, frictionless, invisible and, with luck, noteworthy, all executed at massive scale. It means seeing a great transaction – a la Amazon, Netflix, or Halo – as the foundation of a great experience. Getting it right – whether your end customers are booking a room or figuring out which life insurance they need – is the work ahead.

‘X’ Marks the Spot: Your Back Office Is a Hidden Treasure Chest

As we’ve shown, digital means business (at least on the revenue side). However, the impact on cost thus far has been, well, meager. Currently, across all industries, executives say digital is costing their companies about 1.4% of revenue (see Figure 5). Decision-makers are investing in digital in hopes of growing revenue and, in just a few cases, cutting costs down the road. Over the next few years, the picture improves, but not by much. There’s a wide degree of variability across industries (more on that later), but, in aggregate, costs are expected to decrease by only 1.3% globally. This apparent rounding error on the cost impact of digital is one of the most important findings of the study because it points to a widely overlooked opportunity.
Software Should Be Eating Your Back Office

There may be “gold on the screen” from a revenue perspective, but there’s also wasted cash on the floor of your call center and logistics department. Leaders in most companies have simply not snapped the right new machines into place to reduce costs. Bots, AI and blockchain can help turn your back office into a Pac-Man game, with software eating up your organization’s inefficiencies.

Recognize that digital is not just for sales and marketing.

The shiny new app, the groovy website, the sensor-enabled shoe are all fine, and great things are happening. However, leaders are missing the massive opportunity to apply process automation - software robots taking over certain jobs and job tasks - to hollow out costs in the middle and back office.4

Cut all the fat.

We are well past the automation “theory” phase. Companies such as Trizeetto (a Cognizant technology healthcare software subsidiary) are using software robots to decrease healthcare payer costs by as much as 90% for some middle-office business processes. Other companies like Blue Prism are applying bots to risk, fraud, claims processing and loan management in banking to save millions of pounds.5

Use the savings to fuel digital innovation.

Investment cash is like oxygen – without enough of it, it’s impossible for a business to thrive. Denying these savings is essentially a self-imposed tax on your business future. Automation reduces costs, and smart leaders are using that newly freed digital dividend as investment fuel for innovation. Leaders who don’t use technology to lower costs – now – will never be able to pay for the innovation needed to win in the digital economy. Software is not only eating the world, as Marc Andreessen noted; it should also be eating your back office.

From ‘Follow the Money’ to ‘Follow the Algorithm’

Investments into all things digital are booming. Sure, there’s hype; sure there’s froth; but if you’re sitting on the sidelines thinking you can let your competitors take the arrows and then ride in like a conquering hero, think again.

As with the revenue picture, there are some big differences in spending across the industries we’ve examined (i.e., retail is likely to invest more than any other sector). What is more noteworthy, however, is the alignment across industries. In all areas, people on the front lines of the future are putting their money where their data will be (see Figure 6).

On average, respondents say their organizations are investing 12.1% of their revenues into becoming digital each year. (“Leaders” are investing even more, 13.1%, but 12% is a significant amount in its own right.) Given that the total revenue of studied companies is $7.3 trillion, this means that the 2,000 organizations in this report will spend, in sum, almost a trillion dollars ($950 billion) on digitalization in 2016. In the next four years, this figure will increase by about 36% to 16.5% annually. In 2020, our respondents will spend $1.445 trillion on digital. A tidy sum, to put it mildly. Historical spending on IT (averaged across all large industries) has run between 5% and 7% of revenue. Clearly, the force of the digital revolution has already increased this substantially and is set to fuel investment even further in the short to medium term.

Companies understand that a dollar spent on digital is better than a dollar spent on pretty much anything else at the moment. Study respondents expect returns on investment to average out at 86.1% between 2015 and 2018. In some industries, these expectations are even higher (i.e., retail leaders expect a 119% ROI). These great expectations are born of experience and precedent. Digital transformation works in a virtuous circle and creates a positive feedback loop: The more you invest, the more you make and can reinvest — until your business is in a position to outcompete those that take a more conservative stance. The digital wave will create and require a re-set of IT investment norms — the historical figure of 5% to 7% will be a low benchmark going forward — to truly keep pace with where the market is going.

Digital Spending

The amount of spending for digital across industries was surprisingly consistent, both in 2015 and 2020.

Go Big, Go Digital, or Go...

What other area of business activity will see an increase of 36% in spending in four year’s time? Answer: none. Digitization is the area of focus, investment, growth, energy and excitement in your immediate future. Strategically and tactically, this makes your work ahead very clear.

Prioritize, prioritize, prioritize.

If deepening, broadening, strengthening extending or improving your digital presence isn’t the number one thing on your “to-do” list when you get out of bed first thing every morning, you might want to go back to bed. The world is quickly becoming “digital first.” Whether it’s upgrading the sales interface or the supply chain, it’s vital for your current game plan to mirror our core theme of “widgets to digits.”6

More please!

If your company’s investment profile is not in line with these trends, then you’re playing by yesterday’s business rules. If your budget’s investment profile is not in line with them, then you’re at risk of being the dinosaur among your peers. You will win points for asking for more budget for digital initiatives – rather than less – in the next budget review cycle. This is no time for shrinking violets to pull back from the fight. Go big. Go digital. Or...well, you know the rest.


Beware the Laggard Penalty

Some organizations are doing better than others with becoming digital. Being worse than your peer group, however, comes with a high economic price. Companies behind the curve are paying a large annual “Laggard Penalty” — the difference in both cost and revenue performance due to technology. And over time, it’s enough to change the company. (See page 37 for how we defined and identified leaders and laggards.) Significant differences in Laggard Penalties exist across industries (see Figure 7). In financial services, for instance, digital laggards, on average today, have a total economic impact of about 3.3% of all costs and revenue. Leaders have an impact of about 7.4%. This means leaders have a 139% advantage over laggards when it comes to digital.

In the last financial year, the Laggard Penalty reached about $262.5 billion across the 2,000 companies we studied. That’s bad enough, but it grows like a weed over time. By 2018, that Laggard Penalty for studied companies will add up to a massive $1,315.6 billion (see Figure 8). Like money owed to a loan shark, the penalty is more than you probably imagine, and the vig accrues quickly over time. For non-leaders, the average penalty across all industries that will be “paid” by each company studied is about $692 million between 2015 and 2018. (Again, your penalty may vary depending on your industry, level of digital maturity, region and other particulars.)

Not Being First Means Being Last

These are, again, some pretty big numbers. What does this mean for your organization, and — more importantly — what can you do tomorrow to avoid drawing a red card?

So What Does that Mean in Dollar Terms?

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Find your bearings.

Trying to convince your CFO that “something needs to happen” without a solid set of financials is a tough way to start. Knowing how your organization is performing against others in your industry is a great way to start. Get a rough idea of whether or not you are paying the Laggard Penalty to help you create the much-needed financial justification for taking bold steps toward becoming digital.

Raise your anchor!

The digital runners-up are losing because they are pulling a boat anchor (of cost) through choppy waters. Like compounded interest, being slow and expensive means your company is likely to be slower and more expensive over time. Currently there is money on the table — lots! — but the digital spoils will go to the swift. There are not more than two years left on the clock — that’s a blink in CET (Corporate Enterprise Time). After that, if your organization is still paying a significant Laggard Penalty, it’s time, as the business axiom says, to “prepare three envelopes.”

THE FUTURE OF JOBS (INCLUDING YOURS!)

By now, your head may be starting to spin. We’ve laid out some big numbers and made some big claims about how digital transformation is impacting the commercial game that organizations play and the challenges to their continued relevance.

Grappling with this data and processing our recommendations is a non-trivial undertaking. At the same time, you’re probably beginning to ask: “What do these changes mean to me?” Not so much to the company you work for or manage or founded, but for you and your day-to-day work: How will that change in the future, and how prepared are you to make the necessary adjustments to ensure your relevancy for the work ahead?

Each of us has a “work” role to worry about. But everyone, ultimately, is also an individual who must worry about a personal future. Next, we’ll explore how business leaders think their work will change, and we’ll look at clues that reveal the steps needed to make the future of your work, work!

Every Aspect of Your Work Life Gets Better (Probably)

If you were to believe most of what’s said about our current digital shift, you’d be forgiven for concluding that we’re all simply doomed. Yet in spite of the growing chorus of negativity, leaders across the world – those on the front lines building the future – are surprisingly positive about how our work lives will improve. The majority of executives strongly anticipate productivity improvements, efficiency gains and improved collaboration from applying new technologies to customer experiences and back-office work. A vast majority of leaders (87%) expect personal productivity to improve due to new technologies (see Figure 9). Perhaps more striking, a majority of respondents see digital as improving 14 out of 19 job aspects we asked about.

Senior executives envision digital impacting their personal work dramatically, improving measurable outcomes such as productivity and efficiency, but also softer metrics such as increasing creativity and innovation.

The Potential of Digital...

Senior executives envision digital impacting their personal work dramatically, improving measurable outcomes such as productivity and efficiency, but also softer metrics such as increasing creativity and innovation.

- Improved my productivity: 87%
- Helped me work more efficiently: 74%
- Helped me collaborate more efficiently: 69%
- Allowed me to be more creative and innovative: 65%
- Helped me better serve customers: 63%
- Improved my job satisfaction: 61%
- Improved and expanded my job skills: 60%

Source: Cognizant The Work Ahead Study 2016

Figure 9
Hominus ex Machina: The Future Shape of Your Work

Just as tools shaped work 200 years ago (a farrier’s work was shaped by a hammer and an anvil) and continue to do so today (a quantitative analyst’s work is shaped by computing devices and software), our new tools will reshape — are reshaping — our work for the future. Our respondents already have a good read on how the new machines will change exactly what it is that they do. Almost everyone in our survey (97%) agrees that “jobs and required skills will change significantly” because of digital innovation. It should be noted that this does not lead directly to large-scale reductions in the number of people needed to “do” work, which is a widespread meme in today’s zeitgeist around AI and robots. Only a third of our survey respondents believe it “very likely” that fewer people will be needed in the workforce. The vast majority believe, as we do, that our unquenchable human ingenuity will continue to find plenty of work for human hands and brains to do to satisfy our wants and needs. The need to elevate the role of homines relative to machina clearly represents an expectation, a marching order and a hope. People expect automation to reduce rote work. In addition, leaders understand we will need to elevate our work contribution by being more strategic. There is also wide consensus that whatever you call them — machines, algorithms, software, bots — our new silicon-based partners will help us work faster and more analytically, and further necessitate the need to be a specialist rather than a generalist. The future of work will have little place for slow-moving “all-rounders,” comfortable with business as usual.

Around Every Silver Lining, There’s a Cloud

Most business leaders exhibit a high level of optimism. They believe, strongly, that business will get better, things can improve, and that they can be a part of it. C-suite executives tend not to be naïve or Pollyannaish: they are simply hopeful. Their optimism about the digital impact on the future of work is great news for all of us (really); however, a cautionary minor chord rang from the data. Roughly 63% of respondents did not agree that new technologies would help them keep their jobs. Approximately 66% did not feel that new technologies could protect them from being replaced by a bot. And around 80% had a moderate or significant concern that technology will “take jobs from people I care about (and maybe me).” We think these findings indicate that leaders have largely moved past the hype phase of digital. They understand that the theory has moved into real practice, with tangible implications — both positive and negative — and they are seeing the full range of opportunities and risks. This is good news, and there are some actions to take to ensure your organization is focused on the right work ahead.

Become a “paranoid optimist.”

As Intel co-founder Andy Grove famously observed, “Only the paranoid survive.” But just as complacency breeds pink slips, optimism fuels change. An optimistic vision can make all the difference in leading a business through a period of genuinely disruptive change. A checklist for displaying such optimism may sound like a help book, but if you want to help yourself, cultivate that balance of hope for the future, but with a clear-eyed view of the risks, financial implications and effort required.

Use this data as a baseline.

Some of our findings (particularly the global economic data) might be difficult to apply to your individual job or company. In this case, use these questions to assess your own perceptions and those of your teams: How do your perceptions compare with those of leaders from all over the world? Are you too paranoid? Too optimistic? Maybe this is a wake-up call, or perhaps you are overly worried about the potential downsides of the digital future. This simple exercise will take almost no time at all, and it has tactical implications for hiring, managing, team structure, incentives and so on, of all which need to be tuned to our digital economy.8

Practice Creating a Strategic Future

The “manifest destiny of machines” is delineating two different types of employees in organizations around the world: those that embrace the possibilities of the next wave of technology, and those that fear the risks. Ensuring that you (and your team and your organization) are on the right side of this schism is job 1 for everyone. The following tactics can help in this task.

Have a strategy for being strategic.

“Strategy” is an amorphous word to most people outside of strategic consulting firms, and in truth, it can legitimately mean many different things in many different scenarios. Rather than just have your teams throw the “S word” around — “We need to be more strategic,” “Johnny, you need to make a more strategic contribution” — schedule time (individually and for groups, formally and informally) to help people understand exactly what “being more strategic” means in the context of the work for which you, and they, are responsible. Although there are no certainties about the future of work, this is no time to let uncertainties fester.

Put in your 10 hours of practice.

Consumer-style apps and services are undoubtedly easier to use than previous generations of enterprise technology, but to many “digital immigrants,” they are still less than perfectly intuitive. Yet few organizations spend any time showing employees how to use and optimize new digital tools (Slack, Tableau, etc.). People may not need 10,000 hours to master the tools of the future, but they could do with 10. Some training wouldn’t kill them (or your budget).

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How to Beat the Bots? Be a Better Person!

For years, “Beat the bot!” has been something of a battle cry across wide swaths of people doing primarily physical work. Now the same message is starting to emanate from knowledge workers (maybe even you). It may sound counter-intuitive, but in a world of more pervasive technology, activities that humans do well will be even more important in 2020 than today (see Figure 11). Analytical, communication and learning skills, as well as the ability to relate to other people, are all vital for business success. But in the coming years, these very human traits — things we do naturally, but computers struggle with — will become even more essential in our personal and work lives and for our businesses.

You Need to Be a Better Human (By at Least 15%)

The downside to automation, of course, is that some tasks — and full jobs — will be assumed by machines. All of us — bosses included — will need to enhance our current skill sets but probably not in the way many expect. (Spoiler alert: We don’t all need to learn to code.)

Realize that the doomsday soothsayers are as wrong as ever.

The data clearly shows that for all the human job skills we asked about — the ability to engage with others, lead, reason and interpret — will dramatically increase in importance. You might ask, “But what of the robots doing even more human stuff?” If you speak with people actually building the new machines, they’ll tell you that fears about robots replacing all human knowledge work overnight is largely indicative of the hysteria that accompanies every major shift in technology. (People have been worried about new technologies impacting society since the invention of the written word, which Socrates was against ...).10

Be a better human.

We’re not saying there won’t be an impact — far from it. Machines will pick up a greater number of discrete tasks — and even jobs — as time goes on, but humans will “still need to apply.”11 Software bots today can’t dance, sing, adjudicate a trial, comfort a patient, ask insightful questions, teach a child or lead a team. They can help, but they can’t do it. Being able to apply judgment, creativity and the human touch are all far outside the purview of current and near-future technologies, and this will remain the case for some years to come, even as the new machines become more capable. Our work ahead will require us to double down on the activities where humans have — and will continue to have — an advantage over silicon (e.g., collaborative problem-solving, creativity, abstract thinking, adapting to changing conditions, balancing a work life with a personal life and so on). The work ahead won’t so much be about “beating the bots” as about being better humans in the digital economy.

Be a better human.

We’re not saying there won’t be an impact — far from it. Machines will pick up a greater number of discrete tasks — and even jobs — as time goes on, but humans will “still need to apply.”11 Software bots today can’t dance, sing, adjudicate a trial, comfort a patient, ask insightful questions, teach a child or lead a team. They can help, but they can’t do it. Being able to apply judgment, creativity and the human touch are all far outside the purview of current and near-future technologies, and this will remain the case for some years to come, even as the new machines become more capable. Our work ahead will require us to double down on the activities where humans have — and will continue to have — an advantage over silicon (e.g., collaborative problem-solving, creativity, abstract thinking, adapting to changing conditions, balancing a work life with a personal life and so on). The work ahead won’t so much be about “beating the bots” as about being better humans in the digital economy.

The incredible changes in the work ahead are — to a large extent — the result of the growing ubiquity and power of the new machines that drive modern businesses forward. In their seminal 2014 book, The Second Machine Age, MIT-based authors Erik Brynjolfsson and Andrew McAfee outlined a theory postulating that machines used for intellectual work would change what people do for a living, in the same way that machines for physical work displaced people from the fields and assembly lines in previous generations. This theory is becoming our inexorable reality. Building, leveraging, supporting and managing the new machines is the imperative for the next 30 years of work. It is your (and your organization’s) most fundamental opportunity. And it is your (and your organization’s) most fundamental challenge.

Next, we’ll examine how to survive and thrive in this new machine age — an age of co-existence with robots and artificial (super) intelligence. We’ll explore how we can all continue to add value in capitalist markets that — like it or not — become more demanding and more unforgiving by the day.

AI Is No Longer in the Laboratory
It’s Set to Transform Work Over the Next Two Years

AI skeptics have long relied on the old saw that AI is just a few years away... and has been for decades. Don’t buy into that dismissiveness or denial any longer. We’re already surrounded by AI and its impact on work, which will be explosive before the decade’s out. We asked executives to name which forces would have the biggest impact on work between 2015 and 2018. The implications of business analytics are well known, and have been digested for years, so it’s no surprise that 99% of leaders globally see analytics (a.k.a. big data) as the most impactful game-changer through 2020 (see Figure 12). What will be much more surprising — to some anyway — is that AI was regarded as the second most impactful digital trend, closely behind big data. In fact, 1980 of our respondents — 98% – said the rise of the new machine will have a moderate or strong impact on work. Would you bet on the 20 who disagreed? No, we neither. The view is consistent across every cut of the data we looked at: by region, industry, company type and age. Everyone agrees that analytics and AI (which of course, are increasingly symbiotic) will be the number-one driver of business change by 2018. Together, they’re set to upend everything.

The Future of AI Is the Future of Work
Leaders from every region, every industry, every company type, of every age all noted that AI combined with analytics, will be the number-one driver of business change between 2015 and 2018.

Percentage of senior executives that believe the following will have a moderate or strong impact on work.
What’s been percolating in the laboratory for decades is now set to hit us hard. The unevenly distributed future is spreading into a much more evenly distributed present. Over the next few years—no more than 12 quarters—every aspect of our commercial world (and much else besides) will be affected by the new machines. In short, the future of work is the mirror image of the future of AI. If you’re not making AI your business today, AI may well put you out of business tomorrow. Here are two steps that will embed AI into the heart of your organization in a rapid, material way.

The board matters.

Although we may live in a “post-hierarchical” organizational culture nowadays (a “wirearchy” as we say in our book Code Halos), the board still matters (board members will be pleased to read). What they say, and how they say it, still grabs the attention of people whose attention counts. Therefore, it is incumbent on boards—indeed, it should be their number one priority—to signal that rewiring the company or organization to take advantage of the new machine (with analytics and AI at the heart of the rewiring) is imperative and non-negotiable.

In every phase of new technology deployment, there is a tendency in the excitement and panic of the days of “inflated expectations” to issue mandates that, in effect, are Nike-esque: “Just Do It.” “Just Do Cloud.” “Just Do Big Data.” “Just Do Software-Defined Networks.” While these battle cries are better than nothing (at least people understand that change is upon them), they tend to backfire. That’s because those having to do the “do” typically don’t know how much of the “do” they should do! This is why metrics matter. Tell your teams how many data scientists you want hired in the next 12 months; the number of algorithms you want developed; the new revenue ideas you want brainstormed through an idea factory; the number of team members you want re-assigned to other work due to machine-generated automation efficiencies. You will well know that many of the metrics won’t be reached, but you’ll convey a sense of urgency, seriousness and rigor to what otherwise can be nebulous, vague areas of exploration.

The New Tools of Commerce: Some Assembly Required

Only a few things in life are certain: death, taxes, the Cubs will (probably) lose, and technology will advance. Another thing that’s mostly certain is that the technologies that will matter most to business over the next four years are already in use today. Further ahead, there will be new inventions that matter a lot (eventually), but the technologies that will shape business in 2025 exist today (even if they’re in a startup, lab or Elon Musk’s garage). To the surprise of no one, the technologies with the biggest business impact so far include cybersecurity, analytics, mobile, sensors and cloud (see Figure 13). (It’s notable though, that the number of respondents saying that any of these technologies had significantly impacted business was relatively low, so there’s lots of room for improvement.)

Looking ahead to 2020, the picture changes. Big data and analytics will still rank near the top, but other technologies – such as sensors/Internet of Things, digital security and AI – will move up dramatically, and stay there (see Figure 14). With one notable exception – blockchain – all 10 of the top technologies ranked on impact for 2020 stayed in the top 10 for 2025. (Blockchain today is still in the Pets.com and Napster phase of the hype cycle. Its potential is so big, however, that serious leaders hope this technology will shape business in the coming years.) According to people calling the shots at major businesses the world over, recent technological advances – IoT, AI platforms, digital currency and sharing-economy tools – will have far-reaching business implications. In line with the view from the mountain top (at the World Economic Forum in Davos), executives said the business impact from these technologies will at least double over the next four years, and the impact of some will even triple or quadruple by 2025.12

**We’re 15% through the 21st Century. Are You Ready Yet???**

As new tech moves from toys and tools of convenience to the enterprise, it will provide the boost needed to repeat technology-driven productivity gains last seen in the 1990s during the Internet boom. We’re going out on a limb here a bit. We think the market may actually be overlooking one critical technology that’s likely to have the largest impact on business. We think artificial intelligence - real-world AI, not HAL or the Borg - will be at the core of the digital shift. Why? AI is now thought of as a single software technology, but it’s really not.

What we call AI could more accurately be described as a stack or – perhaps more precisely – a system that pulls together multiple technology components. Apps, algorithms, sensors of every kind, people (can’t forget them!), connectivity, data, systems of record, regulatory requirements and so on all make up the technical systems that bring digital to life. We have memorable technology-based experiences in both our personal lives (Fandango or Facebook) and professional lives (Predix) when all those elements integrate as a system of intelligence with AI as the core. These systems – Waze, Predix, Palantir, Google, Lex Machina, Apple Pay, McGraw Hill’s ALEKS and so on – are the clockworks of the so-called Fourth Industrial Revolution.

What does all this mean for tomorrow?

**Artificial intelligence will mean real value.**

The implications for business decision-makers almost couldn’t be bigger, and your strategies and investments should reflect this. It’s time for a hard look at the technology in your business. (We mean all the technology, not just what might be centrally controlled by IT. That’s you, marketing…) Process by process throughout your entire value chain, you should identify ways to apply AI to change how work is done and how customers engage with your business.

**Realize that the starting gun has already gone off.**

Our data shows that around 76% of leaders today think AI will have a significant impact by 2025 rises to about 38% (a 400% increase). Such growth is not small potatoes, but we think the impact could be even bigger than anticipated. If you’re not starting to run down the track already, it’s time to move it! It’s still not too late to get started, but if you aren’t taking steps now to plan and act for 2020, much less 2025, you’ll very quickly find yourself fighting a 21st century war with 20th century weapons.
WHAT COULD POSSIBLY GO WRONG?

Growth, better jobs, fantastic technology. Overall, we’ve painted a pretty optimistic picture of the future of work. And we are optimists! Based on the research we’ve conducted (including this latest study), as well as our work with customers, thought leaders and innovators, we come away largely with a sense of hope for new technologies and our work ahead. So what could go wrong? Plenty! We are not naïve about the debit side of the equation. Our data shows that leaders are — fortunately — tuned into obstacles as well as the plausible negative effects of technology on our lives and our jobs.

Days of Bots and Roses? Not Exactly... the Digital Dark Side

People often imagine the future as either utopian or dystopian, but history shows the reality is usually a mix of both. The coming digital age will be no different. There is a dark side to digital if we don’t manage our new machines properly.

Given all the headlines about hacking, over-sharing on Facebook and even career-impacting tweets and Snapchats, it’s not surprising that privacy tops the list of concerns for 84% of respondents. The next tranche of worries focused on deeply personal impacts. Leaders are concerned about technology causing them to be overwhelmed by information and that software will eliminate jobs. A loss of freedom, becoming disconnected from the natural world and even disengaging from friends and loved ones all ranked high on the list of concerns related to the digital shift (see Figure 15).

Concerns Regarding Shift to Digital

Executives cite various concerns with the move to a more digital world, and the greatest concerns revolve around security; personal information will be compromised, digital terrorism will increase, and fraud and theft will become more rampant.

<table>
<thead>
<tr>
<th>Concern</th>
<th>Percentage</th>
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</thead>
<tbody>
<tr>
<td>Personal information of people will be compromised over the internet</td>
<td>87.8%</td>
</tr>
<tr>
<td>Digital terrorism will increase</td>
<td>87.2%</td>
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<tr>
<td>People will be more exposed to fraud and theft</td>
<td>85.5%</td>
</tr>
<tr>
<td>Automation and technology will replace jobs</td>
<td>80.2%</td>
</tr>
<tr>
<td>We will be connected to our information in our daily lives</td>
<td>78%</td>
</tr>
<tr>
<td>Money “seems on the way out”</td>
<td>77.7%</td>
</tr>
<tr>
<td>Technology will operate as the ultimate world controller</td>
<td>72.9%</td>
</tr>
<tr>
<td>Environment will be shared on an ad hoc basis</td>
<td>72.1%</td>
</tr>
<tr>
<td>Fears about fraud and theft will become more rampant</td>
<td>68%</td>
</tr>
<tr>
<td>Executives cite various concerns with the move to a more digital world</td>
<td>60%</td>
</tr>
</tbody>
</table>

Figure 15: Source: Cognizant Center for the Future of Work, 2016

Fight Night! Neo-Luddites vs. the Geek Squad

Just as fire both warms and burns us, powerful technologies are both an asset and a liability. Well beyond the irrational exuberance phase, senior leaders are walking toward the future with eyes wide open. This is good because awareness of the downside helps us navigate a healthy path. Here are two points to keep in mind.

Don’t over-index on the scary monster stories.

The worst part about the dark side of digital is that all of these fears will come true. In fact, they already have. People in their personal and company contexts are already sharing too much information. Fraud, theft and depersonalization already exist as screens pull us away from our family and friends. People are already snogging on other people. It’s all happening now, and we’ve survived. Smart company leaders are adapting to our new digital reality faster than many thought possible, and you can too. Security breaches are now expected, so you should get ready to absorb and manage the inevitable hacks. The targets of the biggest macro-hacks – Target, J.P. Morgan, the U.S. Office of Personnel Management, etc. – paid a steep price, but virtually all are still open. This is usually a mix of both. The coming digital age will be no different.

Prepare to steer through a bumpy course.

For leaders wrestling with these issues today (which is everyone), the best advice we can offer is to focus on playing the long game and expect bumps in the road. Keep in mind that the antidote to the digital dark side is to recognize this shift is going to happen, just like the Industrial Revolution happened, and while we can’t stop it, we can steer it. The decisions we make, the ethics we adopt in our companies, the passion we show for doing the right things, the cultivation of a sense of bold optimism may all sound banal, but they truly are the human strengths we must bring to the new machine age – if we’re to improve our collective lot. (And remember, every machine ever made has an off switch, somewhere.)

The Kids Are NOT Alright ...

The fabled “digital natives,” reared by iPads and Xbox while their parents e-mailed over dinner (and watched Mad Men on Netflix, simultaneously), are thought — in the current conventional wisdom — to be “down” with “awesome” new tech and set to reenergize big business as they become a larger and larger part of the workforce. Our research doesn’t exactly support that optimistic point of view. In fact, our MBA student respondents see more negative about the impact of technology than do executive and mid-level managers (i.e., their elders, if not always their betters).

Top Digital Concerns

Executives and managers are more sanguine about the impact of digital transformation than MBAs and Futurists.

Across a wide range of concerns about “digital,” MBAs have bleaker and more dystopian views of the impact of the new wave of technology than any other cohort. (MBAs are our closest proxy for “digital natives” given that MBA students are typically in the 22-30 age range and were born following the widespread adoption of PCs.) MBAs report being overwhelmed with information, and concerned that they are losing their ability to think and process amid the digital deluge. They’re beginning to question the “always-on” environment in which they’ve grown up, worried that work and family life (robots) will take jobs from people I care about. And were born following the first wave of technology than any other group. While executives and managers are forging a path into the future, conscious of but not overly troubled by the digital dark side, young people and futurists — those presumably paying the closest attention to the possibilities and pitfalls of what’s ahead — are not so sure.

What explains this clear, and somewhat surprising, difference of opinion? Are futurists — assumed to be attracted to the future — falling out of love with it because they see things more clearly than those simply trying to make next quarter’s numbers? Or are they spending too much time in the talking shops and salons, where imaginations can often overheat through over-analysis? Are younger people more downbeat simply because of the hard yards they’re wading through and the financial burdens they’re taking on? Or are they canaries trying to get out of the coal mine before it’s too late? We suspect, for both cohorts, it’s a little bit of both. Sowing FUD (fear, uncertainty and doubt) is as much a ticket to the rubber chicken circuit as “cheerleading” is. For MBA students (particularly in the U.S.), exorbitant student debt is enough to take the shine off anyone’s day.

A Recipe for the Future? One Part Realism, One Part Optimism

Whatever the reason for these differences, the results here are surprising. While everyone shares concerns fairly equally over a “digital Pearl Harbor,” the deltas between “natives” and “immigrants” in other areas should give us pause. Indeed, these differences are crucial to messaging to, monetizing and managing these different groups.

Be realistic.

C-suite residents probably have an over-idealized view of how the future will unfold. Digital does have a downside, and its risks should not be dismissed out of hand. Acknowledging risk, and then crucially having a plan to mitigate it, will, as ever, be a crucial differentiator between success and failure.

Be optimistic.

Pessimism has never been a great business model. Of course, bad things will happen in the bright new future, but shrinking from that future — just as it’s about to get really interesting — will be a career-limiting approach. A certain degree of cynicism is a beautiful thing; cynicism born of first-hand knowledge can be a powerful credential. But optimism is what gets things done. Building the future is going to require that many things get done, simultaneously. Best to keep reservations about the future to yourself.

Obstacles to Becoming Digital:

Speed Bumps, but no Brick Walls

Whenever a big organizational change should happen but doesn’t, major blame is often placed at the feet of senior leaders. Sometimes this might be justified, but in the case of digital adoption, most C-level leaders see only speed bumps — not brick walls — on the road to digital. Sure, 29% of our respondents said budget constraints were a real problem, and 25% tried to flee from the inevitable by hiding under a “security” blanket, but these findings come as no surprise (see Figure 17). What is perhaps most interesting about this finding is how low all the concerns are. Budget constraints top the list, but 71% of senior leaders don’t see finances as a major obstacle to becoming digital. In fact, 75% of leaders don’t see security issues as a force powerful enough to stop the coming change.

Obstacles to Transformation

The top obstacles include funding, security and unpredictable market conditions.

As an aside, evidence is mounting — study and anecdotal data — showing a growing number of companies actually decreasing spend on security while increasing spend on responding to hacks. See: “Distribution of Internal Costs of Companies Due to Cybercrime in the UK,” Statista, https://www.statista.com/statistics/478876/distribution-of-internal-costs-of-companies-due-to-cybercrime/
Roll Over the Bumps
Changing markets, talent shortages, the ever-popular “lack of alignment” and so on are all legitimate concerns, but none of the expected obstacles showed up as real deal-breakers in the minds of senior leaders. The solution to rough spots in the road? Just keep rolling!

The Digital Delusion
Everybody Thinks They’ll Be Ahead.

We asked leaders how they thought their companies compared with others in their own industry when it comes to applying digital technologies for business benefits. The results for today were about what you might expect. The vast majority of respondents said, “We are somewhere in the middle.” About 14% said they are doing great, and 17% said they’re doing worse than their peers. It was a nice approximation of a normal bell curve (see Figure 18). But when we asked about what would happen by 2018, their optimism started overtaking reality. Almost none of the respondents thought they would be doing much worse than their peers. About 40% thought they’d be around average — a 30% decrease. A whopping 60% said they would be doing better than the rest of their industry — a competitive increase of over 300% in 36 months. We all know that kind of flip in competitive rankings is essentially impossible without external factors, such as a financial crisis, or game-changing consumer innovations, like inventing an iPhone.

It’s not you, it’s me.
Certainly every case is different, but in general, based on insights from senior leaders, if nothing much is happening in your company, the chances are good the root cause is not sitting in or near the C-suite. If your company isn’t moving in the right direction, chances are it’s due more to a gap in logic and execution than people at the top believing that digital is simply a bad idea. If you or your company feels somehow stalled, the first place to look for a solution is in the mirror. (Of course, this isn’t always the case. If your executive team looks at our list of obstacles and treats them as “legitimate reasons to maintain the status quo,” then start polishing your LinkedIn profile.)

Build a business case that isn’t smoke and mirrors.
In our client work, more often than not the reason for a lack of motion with digital is that the right logic hasn’t yet been snapped together to justify doing anything differently. This is where we hope our findings can be most useful. It’s up to you! You need to make the argument better, more completely, more convincingly. This change requires both evidence (a lot of which is here) and a bit of faith mixed in.

The Work Ahead
MASTERING THE DIGITAL ECONOMY

How Companies Compare Applying Digital

How does your company compare to others applying digital technology?

Source: Cognizant Center for the Future of Work, 2016

Figure 18
Digital Lake Wobegon: Where All the Companies Are Above Average

If you’re still looking for a sign that something big is happening, this massive shift in expectations is it. Some of these hopes will be met, but most — according to math — will not. You can take a few steps immediately to ensure you have a sharply focused picture of where you are and where you are headed.

Recognize the difference between reality and a mirage.

Radio show host Garrison Keillor tells tales of a mythical Lake Wobegon, MN, where “all the children are above average.” But the joke, as we know, is that the math just doesn’t work out. It’s not possible to have 60% of companies performing much better than those in the middle. As always, there will be winners and losers, but this data shows – a bit painfully – that some of the future losers still think they will be winners. This is what we call the digital delusion.

It’s easy to convince ourselves that things are pretty much OK. They may be, but the only way to avoid the digital delusion is by taking a hard look at the reality of where you are today.

Do a digital audit.

To know how many pounds overweight you are, you need to step on a scale. To know how good you are at math, you have to take a test. If you want to know how well you’re performing with digital, you have to look – process by process, experience by experience – at where you are today relative to what’s possible tomorrow. Your organization could be – should be! – a winner in the digital economy, but there is no digital Lake Wobegon. Setting a strategy without a clear understanding of where you are today is wishful thinking, and that’s not a strategy at all. We’re not suggesting you spend months of time and barrels of cash creating PowerPoint slide decks and go-nowhere prototypes. We are recommending that you should, tomorrow, begin to fully understand at a very granular business process level what you’re doing today vs. what’s possible with new technologies.
Objects in Mirror Are Closer than They Appear

Big quantitative studies, like this one, are often somewhat lagging indicators. They show clearly what happened yesterday. The path ahead, however, extends from the trail we’ve already walked. Digital gets a lot of press — some good, some bad, some hysterical — but this study shows just how far we’ve come and how fast we are moving. Leaders know that digital is big and important, but this study is surprising in that it illustrates just how much is happening — and happening so fast — and how dramatic expectations for the very near future are being met.

Organizations of all types, and the people who run them, who are waiting for a bigger sign that now is the time to leap, will never get signals with more flashing neon than those contained here. Organizations that don’t take the leap are simply missing vital opportunities to use new technologies to cut costs in the “old” and invent the “new.” Digital’s impact on revenue growth opportunities is already changing the competitive landscape, but most individual companies have only scratched the surface of the possibilities of becoming “truly digital.” Right now, new mobile apps, compelling Web experiences and the first wave of IoT solutions, such as Disney’s Magic Band™, Nest and GE’s windmill-fixing robots, are driving customer experiences, but much more is to come.

The good news is, digital is the business opportunity of a lifetime (or more). The bad news — if you can call it that — is that expectations are high, and there’s still a lot of money not yet being made. The choices we make today will determine whether we are prepared, and we’ve provided a lot of initial guidance to help get you started. New tools of convenience have emerged and will continue to arise; but make no mistake, these are the early days of applying powerful digital technologies to transform business strategies, processes, and services. Let us be clear, we believe the work ahead can absolutely be positive for us as individuals and for our businesses and public institutions. Our latest findings make us even more convinced that this can be a “song of hope” for those who are prepared, and we’ve provided a lot of initial guidance to help get you started. New tools of convenience have emerged and will continue to arise; but make no mistake, these are the early days of applying powerful digital technologies to transform business strategies, processes, and services. The choices we make today will mean the difference between a hopeful future, or an extinction event.

Methods and Demographics

We conducted a worldwide survey between December 15, 2015, and January 28, 2016, with 2,000 executives across industries, 250 middle managers responsible for other employees, 150 MBA students at leading universities around the globe, and 50 futurists (including journalists, academics and authors). The executive and manager survey was run in 18 countries in English, Arabic, French, German, Japanese and Chinese. We used telephone interviews for executives and online surveys for the managers. The MBA and futurist surveys were fielded in English using telephone interviews (in 15 countries for the MBA survey and 10 countries for the futurist surveys). The study was conducted with research and economic support from Roubini ThoughtLab, an independent thought leadership consultancy.

Digital leaders were identified based on the responses to three questions:
- What percentage of your company’s revenues today is invested in all technologies — including your central IT budget as well as spend by business units throughout your firm?
- Please estimate the percentage impact of using digital technologies on revenue and costs over the last financial year for your organization.
- How does your company compare with other firms in your industry in applying digital technologies to transform business strategies, processes, and services?

Leaders account for 21% of the sample and achieved scores of 35 or more; Laggards account for 28% of the sample and achieved scores up to 15. The Average group accounted for 51% of the sample.

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<table>
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<tr>
<th>Industry</th>
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<td>Media and Entertainment</td>
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Source: Cognizant The Work Ahead Study 2016
Based in Washington, DC, Paul is Cognizant’s AVP of Strategy for next-generation business solutions. He is responsible for developing direction, service offerings, go-to-market programs, alliances and business development for key strategic accounts.

Paul is an acclaimed industry thought leader, analyst and practitioner in business technology services globally. In addition to authoring dozens of articles on sourcing topics, he has advised on and participated in transactions worth billions in total contract value. Paul is also a frequent presenter at industry events and is regularly quoted in mainstream and industry publications such as Business Week, The Economic Times (India), CIO Strategy Center, Global Services, Computerworld and many others.

Prior to joining Cognizant, Paul was a principal analyst at Forrester Research where he conducted research and advised senior IT leadership from Fortune 500 firms and government agencies on a broad range of outsourcing topics, including sourcing strategy, trends and best practices. In 2008, Paul was named one of the top services analysts globally by the Institute of Industry Analyst Relations. Paul also held key positions in planning, negotiation and successful global program implementation for customers from a variety of industries, including financial services, technology, federal government and telecommunications for Hewlett-Packard and Compaq Computer Corporation. He has robust experience leading enterprise improvement programs, including organizational development, process engineering, communications and instructional development. He holds an undergraduate degree in journalism from the University of Florida and graduate degrees from Syracuse University. His doctoral research was on decision-making related to quality improvement in organizations.

Ben co-leads Cognizant’s Center for the Future of Work and came to Cognizant in September 2011 after spending the previous 15 years with Gartner as a senior industry analyst researching and advising on areas such as cloud computing and global sourcing.

Prior to Gartner, Ben worked for a number of consulting companies, including Coopers & Lybrand. At Gartner, Ben was one of the lead analysts on all things cloud; he wrote the industry’s first research notes on cloud computing (in 1997) and Salesforce.com (in 2001). He became well known in the IT industry for providing predictions of the nature and velocity of the change that would impact everyone as the paradigm shifted again and cloud computing become the foundation for the next wave of competition in global IT.

Ben was also heavily involved in tracking and analyzing the emergence of IT talent from outside western markets and the impact that globalization would have on business and IT strategies for organizations of all types. Ben’s expertise in helping clients see around corners, think the unthinkable and calculate the compound annual growth rate of unintended consequences has brought him to Cognizant, where his charter is to research and analyze how clients can leverage the incredibly powerful new opportunities that are being created as new technologies make computing power more pervasive, more affordable and more important than ever before. Now based near Boston, MA, Ben graduated with a degree in philosophy from Manchester University in the UK, where he grew up.
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