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TECH COMPANIES TO WATCH 2018

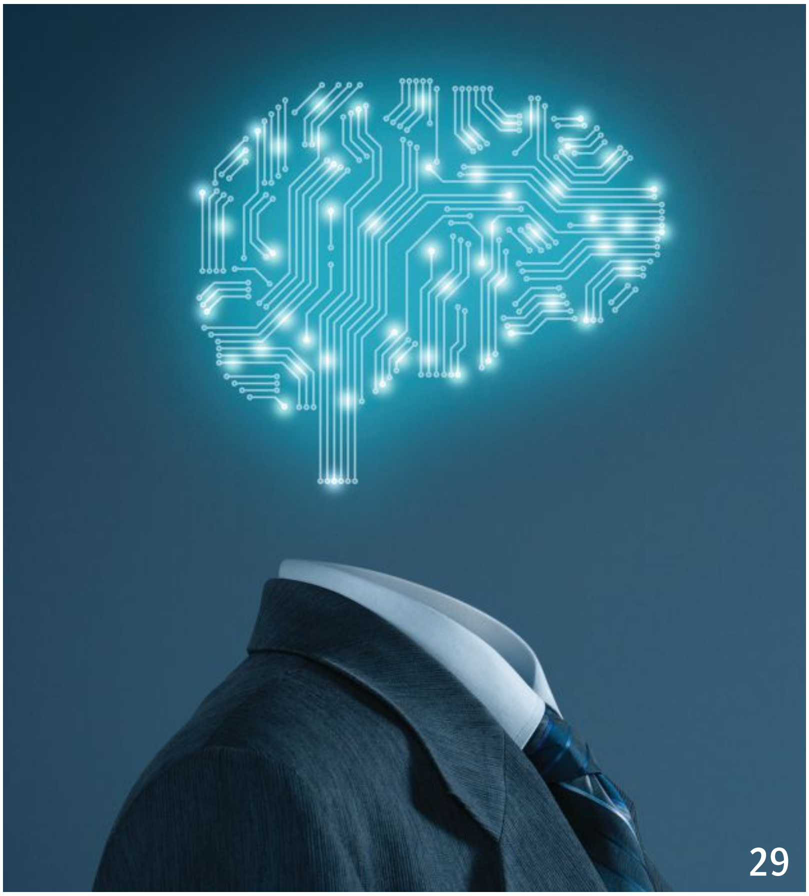
20 vendors making the digital enterprise a reality

SPECIAL REPORT: CYBER RISKS

HABITS OF HIGHLY EFFECTIVE CFOs

IN THIS ISSUE

April/May 2018
Volume 34, No. 2



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Thunder In The Cloud

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FROM THE EDITOR

Embrace The Whistleblower

Providing ethical leadership is among the most important characteristics of a highly effective CFO, according to Deputy Editor David McCann's story on page 14, "10 Habits of Highly Effective CFOs." And, unfortunately, organizations sorely need that leadership. ¶ A recent report by the Ethics and Compliance Initiative found that "more employees than ever before feel pressure to cut corners." What's more, 40% of employees believe that their company has a weak or weak-leaning ethical culture, the ECI found. And the most common ethical violations whistleblowers are reporting to authorities are serious: misuse of confidential information, the acceptance of bribes or kickbacks, stealing, and sexual harassment.

What may be most disconcerting is that while more employees are blowing the whistle on fellow employees, or their managers, or executive management, instances of retaliation against whistleblowers are rising. Of employees who reported misconduct last year, according to ECI's survey of 5,000 workers, 44% said they experienced retaliation by their companies. And companies generally brought down the hammer on whistleblowers quickly: 72% of respondents said the retaliation occurred within three weeks of their first report.

The retaliation numbers aren't that surprising. As two German journalists recently wrote in *The Los Angeles Times*, "The way society treats whistleblowers is schizophrenic at best ... When they're revealed along with the secrets they uncover, they often end up marginalized, shamed, or, worse, threatened. People love the betrayal, not the betrayer."

To help combat this trend, organizations need to reinforce the importance of employee reporting, says ECI. And, to attach an addendum, management has to be clear that whistleblowers won't face reprisals (and, if possible, have policies in place to prevent it).

Embracing the whistleblower may sound like a tough task to some finance chiefs. Really, though, it just flows from the CFO's obligation to be always evaluating the needs of all constituents.

Shareholders, investors, customers, employees, suppliers—in the long run, protecting whistleblowers is in the interest of all of them.

Vincent Ryan
Editor-in-Chief

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EDITOR'S PICKS

FINANCE
CFOs on the West coast, and others, will want to check out the **2018 Financial Leadership Forum** on May 22 in Los Angeles. The speaker lineup includes executives from 20th Century Fox, Northrop Grumman, MGM Resorts, and Brightstar. See the Argyle Executive Forum website for more details.

STRATEGY
While C-suite executives often talk "strategy," they're typically confused about what it means, writes consultant Graham Kenny in **"Your Strategic Plans Probably Aren't Strategic, or Even Plans."** Much of what passes for strategy are really actions, activities, or objectives, says Kenny. Read more on the Harvard Business Review website.

CAREERS
Captain Fantastic is "the guy with the sharp elbows who bruises you on his quest for the Holy Grail of the corner office." You may recognize him and some of the other office archetypes described in **"How to Stop Sabotaging Your Career,"** a podcast Q&A with Northwestern Universty professor Carter Cast. Access the podcast on the Knowledge@Wharton website.

Mark Bennington

There was much consternation to be heard in the run-up to the effective date of the new revenue-recognition rules, and the agitation is continuing afterward.

On CFO.com, contributor Eric Knachel of Deloitte & Touche offered some sound advice for managing the new freedom to exercise judgment in making revenue-recognition decisions. He also pointed out that "such judgments can vary widely, raising the possibility that **different companies will report different accounting results** when presented with a similar set of facts."

Stormed one reader in response: "This 'judgment-based' approach is absurd on its face. It pits the judgment of one company against that of a competitor. Investors already have enough trouble trying to get truly comparative data. **Can you imagine how much more vagary this will introduce?** Not good."

Another audience member had some pointed questions: "If the external auditors disagree with management, whose judgment should prevail? In the case of prior treatments for the same type of transaction, does the entity need to readjust its prior judgments based on the new judgment calls?"

That reader wrapped up by suggesting that the revenue recognition standard has swung too far to the principles-based side: "Rules should still be included as well. Otherwise **we would face another stream of corporate scandals like the ones that triggered the Sarbanes-Oxley Act."**

"Most Companies Have No CFO Succession Plan" also struck a chord among readers. "This issue is much deeper than just the CFO," wrote one. "Most companies do not have a comprehensive emergency continuation plan. While they jump on the latest idea, such as that cloud computing will eliminate any IT problems, they do not have a plan in case they lose the cloud.

"It gets even worse with personnel replacement. **The idea that an executive could no longer perform because of illness or an accident is just not accounted for."**

Agreed another audience member, "Organizations get lulled into a sense of security when senior staff have been employed for a long time. Then a tragic event happens with no succession plan in place and company leadership is forced to make a quick decision, which may not necessarily be the right decision. Just like the budget process, it's important to discuss succession planning on an annual basis."

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TOPLINE

STATS OF THE MONTH

2.9%
Increase in U.S. hourly wages, 2017

7.9%
Increase in median CEO pay, *Fortune* 500

$10.9 million
Median CEO pay, S&P 500

57%
Labor's share of business income

65%
Labor's share of business income, 1975

Note: all figures for 2017, except as indicated
Sources: Mercer, Bureau of Labor Statistics, Harvard Business Review

AUTOMATION

Revolutionary, But a Big Business Risk

The risks to companies posed by the frenzied development of artificial intelligence tools seem nearly limitless. By David McCann

Artificial intelligence surely will change the world. But will it be for better or worse? A new report from Allianz, the world's largest insurer, offers a stark portrayal of how the development of AI could go spectacularly wrong.

Some of the potential eventualities would be societally calamitous on a global scale. But even looking strictly at business risks, there are hefty concerns. The paper cites a 2017 survey by PricewaterhouseCoopers in which 67% of CEOs said they believed AI and automation would have a negative impact on stakeholder trust over the next five years.

And, according to the Allianz Risk Barometer 2018, the impact of AI and other new technologies already ranks as the seventh-top business risk—ahead of political risk and climate change. "AI exposes businesses to threats that could easily counterbalance the huge benefits of a revolutionary technology," Allianz writes.

Signs are evident already. Look, for example, at Microsoft's 2016 AI experiment, in which a bot named Tay was kicked off Twitter the same day it launched for becoming "a sexist, racist monster," as *TechRepublic* put it. Indeed, one of the leading current uses of AI is powering customer-service chatbots. "Autonomous chatbots trained on language texts are prone to learn and perpetuate human prejudices and unfairness," observes Allianz.

The specter of AI agents that get smarter on their own also presents confounding implications for legal liability. Even after AI products have been tested and are in the

market, it's difficult to identify what exactly might go wrong before damages take place, Allianz says.

"AI decisions that are not directly related to design or manufacturing, but are taken by an AI agent because of its interpretation of reality, would have no explicit liable parties under current law," the paper states. "Leaving the decision to courts may be expensive and inefficient."

Further, AI is unable, at least currently, to comprehend abstract concepts such as loyalty, happiness, hurt, or values. That could lead an AI agent to act against human interests.

For example, say an AI robotic agent is trained to minimize risky situations for elder-care patients with Parkinson's disease. In order to reduce the risk of falls, the agent starts controlling a patient's opportunities to leave their living quarters. That would reduce social contact and potentially lead to a

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spiral of depression.

Such scenarios may pose bewildering hurdles for companies developing AI technology. "The challenge when developing AI agents is to instill [them] with a distinction between good and bad," Allianz says.

There are also frightening implications for information security. While AI can be used to detect and prevent cyber-attacks, the opposite is also possible.

"AI could facilitate serious incidents by lowering the cost of devising new tools and weapons to launch attacks," the paper points out. "AI could [also be used] to weaken cyber defense mechanisms by utilizing social engineering to psychologically manipulate people into performing actions or divulging confidential information."

Even a slight, unintentional AI error in an internal system could quickly escalate into a major problem that damages a company's reputation and bottom line, with the error replicated on any number of machines.

Meanwhile, AI is already helping to combat climate change by reducing emissions through the use of smart technology and sensors. However, the paper points out, AI is also "a key component in the development of nanobots, which could have dangerous environmental impacts by invisibly modifying substances at nanoscale."

Of course, as an insurance company, Allianz profits from risks faced by businesses and individuals. But judging by the paper, all the ramifications of insurers using AI themselves are positive.

"The challenge when developing AI agents is to instill [them] with a distinction between good and bad."

—Allianz, "The Rise of Artificial Intelligence: Future Outlook and Emerging Risks"

"AI applications will improve the insurance transaction process, with many benefits already apparent," Allianz writes. "Customer needs can be better identified. Policies can be issued, and claims processed, faster and more cheaply. Large corporate risks, such as business interruptions, cybersecurity threats, or macroeconomic crises can be better predicted." CFO

SUPPLY CHAIN

Flaws Seen in Trade Finance Disclosure

Lax accounting requirements for reverse factoring help mask a U.K. firm's worsening finances: Moody's.

The collapse of a construction firm in the United Kingdom has exposed shortcomings in the accounting for reverse factoring arrangements, says Moody's Investors Service. The trade payable financing tactic, also called supply chain finance, allowed the firm, Carillion, to hide nearly 500 million pounds sterling ($704 million) in liabilities, Moody's claims.

The sudden downfall of Carillion, which was a major supplier to the British government, has sparked much discussion and hand-wringing in the United Kingdom over how the company managed to conceal its poor financial condition. (It entered compulsory liquidation in January.)

Under reverse factoring, a bank or other provider pays a company's suppliers faster than the set credit terms in exchange for a discount. The bank carries the debt until the company repays it the full amount the company owed the supplier, enabling the company to stretch its credit terms to extreme lengths.

However, in the absence of a specific accounting requirement under International Financial Reporting Standards, says Moody's, few companies make explicit disclosure of these financing agreements with suppliers and banks. "The possible existence of these arrangements can often only be uncovered by scrutiny of the amounts reported as trade payables and other creditors," Moody's says.

In Carillion's case, "the scale of the liability to banks was not evident from the balance sheet, and a key source of the cash generated by the business was not clear from the cash-flow statement," says Trevor Pijper, a senior credit officer at Moody's.

Moody's says Carillion's 2016 balance sheet indicated that the group's bank loans and overdrafts amounted to 148 million pounds sterling ($208 million). But as much as 498 million pounds sterling ($701 million) was owed under the reverse factoring arrangement, which started in 2013.

Carillion's cash-flow woes were a key issue in its collapse. To help with cash flow, Carillion had quadrupled payment terms on its subcontractors to 4 months from 30 days. In the meantime, Carillion was carrying a debt load of 1.5 billion pounds sterling ($2.1 billion). | VINCENT RYAN

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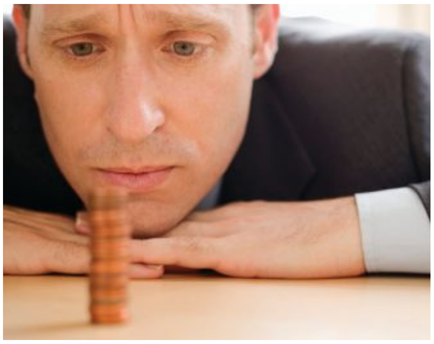
CAPITAL ALLOCATION

Workers Get Tax-Savings Crumbs



Once 2018 began, it became the single biggest question the wider public wanted to know: How did large U.S. corporations plan to spend the windfall bestowed on them by the Tax Cuts and Jobs Act?

A few months and more than 120 company announcements later, the discussion hasn't died down. Indeed, firms like JUST Capital, a nonprofit that ranks companies "based on the issues Americans care about most," won't let it. JUST is tracking what Russell 1000 firms are pledging to do with their nearly $150 billion in found money.

What has it discovered so far? For one thing, workers aren't at the head of the line. Through March 19, only 6% of the cash for which allocation plans had been announced was assigned to workers. More than half of that was for one-time bonuses, not permanent raises.

On the other hand, while 57% of the total windfall was earmarked for shareholders, a fair chunk of the rest was for the betterment of "Main Street." On top of workers' 6% share, 3% was for communities (including charitable giving and volunteering); 7% for product improvements; and 22% for "jobs" (commitments to job creation or capital investment tabbed for job-creating activities).

Another bright spot: 4% of the gains were passed to customers. For example, 12 investor-owned utilities announced they would apply their tax savings to lower prices. Five of them pledged to direct *all* such savings (a combined $23.1 million) to customers. Among the industry's bigger fish, Exelon pledged to return 93% of its $302 million in tax savings to consumers.

Regarding the 6% going to workers, some companies did much better than that, including Darden Restaurants (79%), Boeing (67%), FedEx (48%), Associated Banc-corp (44%), and CVS Health (40%). | V.R.

BUDGETING

Zero-based Plans Get More Entrenched

Zero-based budgeting, where an organization formulates a budget from scratch each year instead of basing it on the previous year, has been around as a concept since the 1970s. However, adoption was limited until the past few years, says Accenture Strategy.

The firm talked to 85 of the largest companies that have switched to zero-based budgeting. Only two of them initiated ZBB before 2011. "Understanding and momentum started building" between 2011 and 2013. And from 2014 through 2017, the proportion of the participating companies adopting ZBB grew an average of 57% per year.

And why not? The companies reported, on average, a 15% cumulative annual cost reduction during their ZBB project implementation period (typically about 2.5 years), compared with a baseline (usually, spending in the previous year). They most often redirected the savings into growth initiatives (52%), digital technologies (31%), and the bottom line (15%).

The companies pursued ZBB for different reasons: 96% of the survey participants got started to improve profitability; 48% were influenced by competition; and 40% cited slow growth as a catalyst.

However, there were two surprises in the responses to that question, according to Accenture. First, only 14% said M&A was a driver. "That flies in the face of common, but flawed, wisdom that says companies typically pursue ZBB in crisis mode in an M&A scenario." The second surprise: "The media is fixated on the pressure coming from private equity funds and activist investors to implement programs like ZBB. But only 8% of companies said this was a factor."

The surveyed companies don't necessarily apply ZBB across the full range of budgeting scenarios. About 92% of them use it for general and administrative expenses, 52% for sales and marketing, and 43% for direct and indirect labor. | D.M.

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FORECASTING

Tech CFOs Eye Revenue Boom

Finance chiefs at U.S. technology companies are highly optimistic about prospects for 2018, projecting an average 12% revenue gain over last year. That's the most enthusiastic forecast tech CFOs have issued since BDO began conducting its annual outlook survey in 2008. "Quantum leaps" in technological progress have led to new business opportunities, behaviors, and ways of thinking, according to BDO's survey report.

Not that there aren't challenges in store. "U.S. technology companies can expect an even greater barrage of competing demands this year, as the full impact of last year's policy changes—from changing trade agreements to shifts in immigration policy to sweeping tax reform—comes to light," says Aftab Jamil, global leader of BDO's technology practice.

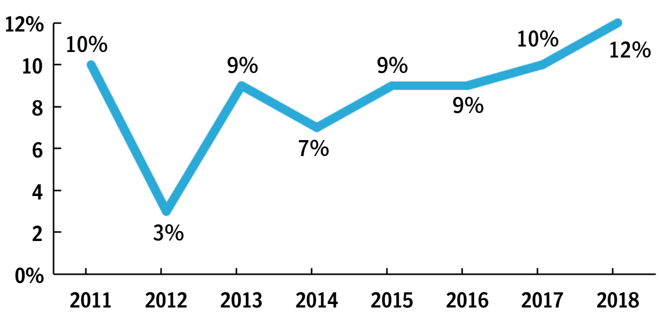
"Nevertheless, the industry's resilience is not to be underestimated, nor is [its] ability to transform setbacks into opportunities," Jamil added. A vast majority (84%) of the surveyed CFOs expected higher revenue in 2018—good news, since almost two-thirds of participants cited revenue growth as their top business priority.

On the IPO front, the finance leaders expected another bountiful year, with 60% of them predicting stock performance for new offerings will improve. Only 11% foresaw a decline. Asked to name the greatest threat factors to tech IPOs, 35% of those surveyed pointed to domestic and global political uncertainty. Next were performance of recent new issues (29%), concerns about valuations (20%), and global market volatility (16%).

A similarly robust year was envisioned for mergers and acquisitions, with 72% expecting tech deal volume to increase. | D.M.

Unbridled Enthusiasm

One-hundred tech CFOs projected a 12% average revenue gain over 2017, the largest forecasted increase since 2011.



Source: BDO

TECHNOLOGY

Digital Overhaul On a Budget

Finance departments won't be getting a budget boost from the windfall generated by U.S. corporate tax cuts, according to a study by The Hackett Group. In fact, finance budgets will again be cut, continuing a long-term trend, said respondents to Hackett's survey. It polled finance leaders of global companies with more than $1 billion in revenue.

On average respondents expected a 1.3% lower allocation, despite forecast revenue growth of 3.6%. That 1.3% is better than the past two years (cuts of 4% in 2016 and 2% in 2017), but it's also larger than predicted cuts to both human resources and procurement departments in 2018.

A key difference this year, however, is that cutting finance budgets was not listed as finance's top objective. In its place was "supporting enterprise information/analytics needs," closely followed by "supporting enterprise digital transformation."

Analytics, of course, will enable finance to "more effectively provide insight so management can make smarter decisions about investments and capital allocation." But it is the broader objective of digital transformation that finance leaders hope "will radically reshape their ability to add value to the enterprise and reduce cost," according to Hackett.

The survey found that 56% of finance leaders have a digital strategy in place, up from 44% last year. Unfortunately, only 35% "believe they have the resources and competencies to execute on their digital transformation strategy." | V.R.

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Don't Promote Top Sales Reps?

For those who thought the Peter Principle was an old wives' tale, the National Bureau of Economic Research begs to differ. A new NBER paper counter-intuitively finds that, after high-performing sales reps are promoted, they tend, on average, to be poorer managers than are lower sales performers.

That creates a conundrum for employers. "If firms promote workers based on current performance, they may end up with worse managers," states the paper.

The research relies on transaction-level data provided by a vendor of sales performance management software. The data includes standardized measures of sales transactions and organizational hierarchy for a panel of 53,035 workers—1,531 of whom were promoted into managerial positions—at 214 U.S.–based companies.

The authors of the paper, "Promotions and the Peter Principle," find that a doubling of sales credits for a particular sales person increases the probability that he or she will be promoted by 14.3% relative to the base probability of promotion.

However, doubling a new manager's pre-promotion sales corresponds to a 7.5% *decline* in subordinates' sales performance. The reverse is also true: relatively poor prior sales performance by newly promoted managers correlates with significant improvements in subordinates' performance.

The reason given for those seemingly bizarre results: "If firms' promotion policies 'discriminate' against poor sales performers, then poor sales performers who are nevertheless promoted should be better managers."

The authors caution against interpreting the research as evidence that companies have mistaken beliefs or behave inefficiently. Rather, "firms may heavily weight current job performance in promotion decisions to encourage workers to exert effort in their current job roles and to maintain norms of fairness." | D.M.

HUMAN CAPITAL

10 Habits of Highly Effective CFOs

Would you believe that striking a healthy work-life balance is one of them?
By David McCann

For many CFOs, the idea of achieving a satisfying work-life balance is something of a fantasy. The hours are long, and the pressure to excel—making certain every big-picture strategy is sound, virtually every detail precisely right—is extreme. One could point to almost any finance chief at a big company, or a struggling one, or one that's growing fast or starting up, and say with a fair degree of confidence, "that person is a workaholic."

But is that a good thing? Not according to someone who should know: Jack McCullough, who served as finance chief for no fewer than 26 startup companies. "Being a workaholic is a mistake," he said during a webinar. "Workaholics are not the best long-term performers. There are times in all of our careers when we have to work 80 or 90 hours a week and forgo other things. But it's not a wise long-term strategy."

In McCullough's view, a good formula for a successful CFO includes a lot of "other things": family, friends, physical exercise, reading (and not just business books), hobbies, and community service. And "if your boss asks you to skip your vacation, skip your vacation but also start a job search and make it up to your family."

So important is striking a healthy work-life balance that McCullough included it in a list of 10 "Habits of Highly Effective CFOs," which was the title of the webinar. "If you don't want to do it for yourself or your family, then do it for your company, because you'll be better at your job," he said.

Also on the list was "continuous learning," and the way McCullough prepared for the presentation offered a perfect example of it. As founder and chief executive of the CFO Leadership Council, he knows hundreds of finance chiefs. But with the webinar coming up, McCullough didn't rely on his past conversations with them, nor on his own long experience as a CFO. Instead, he painstakingly interviewed dozens of finance chiefs, specifically to find out which characteristics they consider to be drivers of their success.

With regard to continuous learning, most CFOs he spoke with are "very intellectually curious," he said. For example, a majority of them have MBA degrees, which finance professionals often obtain after their careers have begun. And all of them are readers.

Many of them highly value mentors, McCullough added. To find a mentor, he noted, speaking with board members is a good strategy, as most of them have many high-level contacts. He advised that CFOs, or those aspiring to the job, seek mentors outside their organizations. It can be awkward, he pointed out, to tell your boss that you need mentoring because you don't understand some things or need professional polishing.

Most of the effective "habits" on the list are no surprise—for example, "thinking strategically." Noting that old-school CFOs were known as the people who said "no" to spending on new initiatives, McCullough said, "Be a CF-GO, not a CF-NO. You want to be involved in making it happen, not putting on the brakes."

Other habits on the list included:

Providing ethical leadership. Overall, the finance chiefs McCullough

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"CFOs seldom lie—it's not in their DNA. But there's more to ethics than that."

—Jack McCullough, CEO, CFO Leadership Council

interviewed identified this as the most important characteristic. "CFOs seldom lie—it's not in their DNA," he said. "But there's more to ethics than that."

CFOs are expected to be the most ethical person in the company, he noted. They need to "fully and accurately disclose all relevant info to all relevant parties. And [they] always need to be evaluating the needs of all constituents, be they stockholders, investors, customers, employees, suppliers, and, every once in a while, society as a whole."

Serving as a trusted adviser. As a trusted adviser, the CFO provides counsel to the CEO, his or her immediate boss. But, McCullough stressed, it's even more important to be a trusted adviser to the board of directors, which represents the interests of shareholders. He offered an anecdote to drive the point home.

At one of his career stops, the company was experiencing revenue-recognition issues. The CEO told him not to tell "Bob," the audit committee chair, about it. "If he wanted to be 100% sure that I was going to call Bob, that's the one thing he should have said," McCullough noted. "He'd now obligated me to call Bob, because my fiduciary duty is to the stockholders. And I told him that's what I was going to do, and I did it."

Communicating proactively. Effective CFOs are forthright in their communication style, he said. If there's bad news, they don't spin it, hide it, or delay it. Their communications are "timely, clear, brief, truthful, and once in a while they need to be compelling, although the other four are more important."

Performing cross-functionally. Most of the CFOs McCullough interviewed said they liked working outside finance more than within it. "A lot of them told me that they're the best person in the company at selling, the best recruiter, the best fund-raiser, the best deal-maker. They didn't say this in a cocky way. A lot of it is the trust factor."

One CFO in San Francisco told him that while it's virtually impossible to hire a lead engineer in the area, he was able to do so. "The reason is because he made the effort," McCullough said. "The CFO gave the guy an hour of his time, and he was flattered. It was about trust: again, there was no spin. It was, this is why we need you and this is the direction we're going in."

Drivers of a CFO's Success

1. Think strategically
2. Communicate proactively
3. Master deal making
4. Build elite teams
5. Learn continuously
6. Serve as a trusted adviser
7. Perform cross-functionally
8. Maintain financial expertise
9. Provide ethical leadership
10. Maintain a work/life balance

Mastering deal-making. The key here is an ability to identify opportunities and risks, not just to negotiate deals. Several of the CFOs McCullough interviewed spoke of a mind-shift they experienced at some point in their careers, when they began to focus on creating opportunities rather than simply solving problems. That's not to diminish the importance of solving problems, he said, but their "world suddenly changed" when they began thinking of their purpose as creating an opportunity for growth, for example.

Building elite teams. McCullough often heard from the CFOs about the need to "build a team for where you want [the company] to go, not where you are today. Think three to five years ahead." Team-building skill is especially vital today, he added, given the shortage of talent "in places where the innovation economy dominates" and the proclivity of "20-somethings" to switch jobs every couple of years.

Maintaining financial expertise. McCullough noted that, recently, each year there have been more financial restatements than the previous year. "Sometimes there is a lack of focus on the financial accuracy part of the job," he said. "It's less sexy than all the wonderful strategic, cross-functional, and operational responsibilities. But while 'GAAP may be crap,' as a former boss of mine used to say, never forget that the F in CFO is for financial." CFO

Editor's Choice

C-SUITE CHURN

Move over, chief legal officers and operational heads. Senior sales leaders at U.S. issuers are increasingly among the top five highest-paid employees, says Equilar. Their number hit 218 in fiscal 2016, up 77% from four years earlier. Equilar suggests the trend is a result of companies "putting greater emphasis on sales expertise and revenue growth."

Top: courtesy Jack McCullough, bottom: Thinkstock

Searching for the Right Price

At specialty manufacturing services firm Xometry, the CFO job is all about pricing complexity. By David McCann

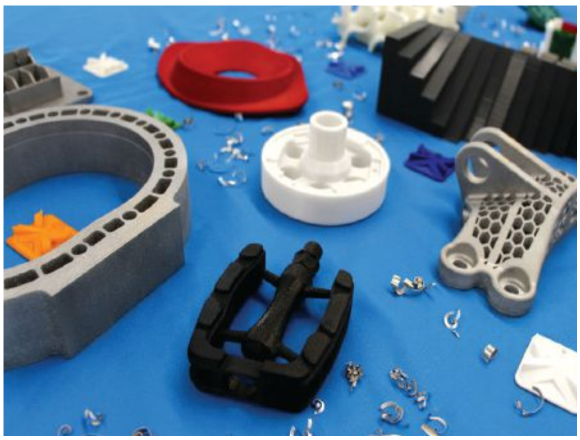
At large companies, many CFOs are only peripherally involved in pricing decisions. At smaller firms, finance chiefs tend to wear more hats. But even there, it's probably quite rare for pricing to be the CFO's primary focus, as it is at Xometry. In fact, the opportunity to instill more rational pricing into a market niche was a key formative element for the company.

A few years ago, Xometry's two co-founders, chief executive Randy Altschuler and CFO Laurence Zuriff, were investigating business opportunities in the on-demand manufacturing arena. They were attracted by the high level of technological innovation, particularly with respect to 3D printing (also called additive manufacturing).

The pair visited many machine shops and additive manufacturing service bureaus. "They were largely mom-and-pop–type operations where a rollup of any kind would not make sense," Zuriff says. "There was [also] incredible price opacity."

They observed extreme pricing differentials for very similar manufactured parts in different geographic locations, as well as variances weekly and even daily. That, of course, posed problems for the manufacturers' customers. Pricing "could change overnight, depending on shifts in supply and demand in very localized markets," says Zuriff. "While that was probably pretty efficient on a local basis, it was inefficient on a national basis."

The founders set about building a network of machine shops and 3D service bureaus. At present, it includes 700-plus businesses. The common denominator among them is their focus on handling low-volume orders—10,000 or fewer units—for specialized parts.



About 65% of the parts delivered to customers from Xometry's network of machine shops are manufactured with 3D printing.

Commercial operations began in February 2014. Engineers at customer organizations upload to Xometry's website computer-aided design files detailing the specs for the parts they need. This is where pricing comes into play. Xometry has a team of data scientists that create and, using machine-learning technology, continually revise algorithms that govern price quotes. The algorithms take into account myriad factors, including materials, shapes, tolerance levels, and design features such as holes.

"If you put a square hole in the middle of a piece of aluminum, the cost might be five to seven times what it would be if you drilled a round hole," Zuriff notes. "The distance of a hole from the edge of a piece of metal has a cost impact, too."

The scientists also perform computational geometry, breaking down the elements of parts' physical structures, another important determinant of the pricing equations.

The Great Unknown

Based on those and other factors, Xometry quotes a price for the order—say, $100 per unit. Then it distributes the order to those network partners deemed to be a good fit for the job, listing a preferred price for the manufacturing, perhaps $80 per unit. The spread between the two prices represents Xometry's profit.

The first partner to accept the job gets it; the speed with which a job is accepted is crucial because the customer, seeking to control its costs, is almost surely investigating other manufacturing options. However, the network partner may quote a higher price for the manufacturing. The $80 figure that Xometry established was merely the mean point in a probabilistic distribution of expected quotes from the partners, also determined by a machine learning-based algorithm.

Xometry thereby assumes pricing risk. It has already provided its price

Courtesy Xometry

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quote to the customer and has no control over what price the manufacturer will quote. If the latter price is above a certain per-unit threshold, Xometry will take a loss on the job.

"Imagine being a CFO when you don't know what the cost of what you're selling is going to be," says Zuriff. "You probably have a general idea, but it's not like you're taking a SKU off the shelf that you bought for $1 and selling it for $2."

Xometry also may choose to keep a job in-house. Its internal manufacturing operation generates about 15% of revenue.

Xometry isn't acting like a broker, taking fixed commissions on business it distributes to a roster of providers. Instead it's acting more like an options trader, whose risk has a fixed upside and a theoretically unlimited downside. In fact, Zuriff says, in its number-crunching Xometry uses math similar to that employed in the Black-Scholes model, which is used to determine the fair value of call and put options.

Customers that use Xometry's services multiple times may gain trust that similar types of jobs will be priced similarly. And the pricing will, on average, be lower than what they'd typically get by dealing with manufacturers individually, according to Zuriff.

Small manufacturers often reject jobs they could do profitably out of fear that they'll end up with a loss, he says. "What we say to them is yes, you're going to make lower profit on some individual jobs—but you're going to get many more jobs that [your competitors] are unwilling to take because they don't understand the risk."

The manufacturers are vetted for quality in a couple of different ways. First, they take a test; Xometry sends them specs for a part that is fairly difficult to make. Second, a new vendor gets easier jobs for a while and must ship the parts to Xometry for quality screening. The quality scores are then factored into the pricing algorithms.

But lower-quality shops are also allowed into the network, because some orders don't, for example, specify high tolerance levels.

First Priority

Zuriff says he spends more of his time working with the data scientists than doing everything else. He provides them with feedback on actual production costs compared with the expectations embedded in the algorithms, allowing continued improvement of the algorithms.

"Imagine being a CFO when you don't know what the cost of what you're selling is going to be."

—Laurence Zuriff, CFO, Xometry

The data scientists closely watch three variables that impact gross profit: "win rate," the percentage of quotes to customers that result in orders; "take rate," the margin achieved on jobs placed in the partner network; and "acceptance rate," the percentage of jobs accepted by a partner within a preset amount of time after the job is distributed to the network.

Zuriff and the team conduct pricing experiments, adjusting prices to gauge both the elasticity of customer demand and the manufacturers' sensitivity to prices for particular categories of parts. All of the resulting data is used to further refine the algorithms.

Another aspect of Zuriff's job is managing relationships with banks to which Xometry offloads receivables risk. The up-front cash Xometry gets in exchange for paying the banks a sliver of the receivables' value is important to the manufacturing partners, who can't wait several payroll cycles to receive payment.

Most of the company's customers are large organizations that can negotiate payment terms favorable to them. General Electric, for example, has 160-day terms. "The local machine shop can't wait 160 days," Zuriff notes. "It's already bought the materials and made the parts, which probably took at least one payroll cycle. Another 160 days after it delivers the parts would be many more payroll cycles."

The receivables-based credit lines from the banks are low cost because of the receivables' high quality. In addition to GE, customers include BMW, the Department of Defense, and NASA.

Big Customers, Small Jobs

While Xometry's customers are large, they generate various small jobs that are appropriate for the manufacturers in its network. For example, an airplane may have millions of parts, but an aircraft manufacturer might only need, say, 2,000 units of any individual part, depending on the number of planes it's building in a particular line. A mobile-device maker may make millions of devices but need only a couple of thousand fixture units that hold them in place during the manufacturing process.

Xometry also serves the medical devices field, where 3D printing allows customization of things like titanium inserts for knee replacements. About 65% of the parts delivered to the customers are manufactured with 3D printing. However, because 3D manufacturing is much less expensive than traditional computer numerical control (CNC) machining, the latter accounts for 65% of Xometry's revenue.

3D parts are also easier to price, and Zuriff expects that over time, with additional innovation, they will comprise more and more of the company's business and allow it to scale.

The pricing complexity, he says, "is what makes the business interesting for a CFO. It's not just plugging in numbers and getting an answer. It's thinking about how all the various changes you can make in the pricing might affect your gross profit and margin." CFO

Courtesy Xometry

CAPITAL MARKETS

The Seven Deadly Sins For Private Equity CFOs

Avoid these key mistakes to keep a finance-chief job after a PE firm acquires your company. By Nick Leopard, Rishi Jain, and Neel Bhatia

Meet Bob. He's the CFO of TechX, a growing SaaS platform-based company. Bob has been its CFO for seven years, having grown into the role from his roots in accounting. The good news: TechX was just purchased by a private equity firm, and Bob is eagerly anticipating the enhancement that will bring to both his résumé and his wallet (the latter via a successful exit). The bad news: Bob will be fired. At least, that's what the statistics say. Post-deal, PE investors retain the existing CFO only 25% of the time.

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Bob—married with two kids, a dog, and a substantial mortgage—has always been considered a competent CFO. He's well-liked by his peers and his junior reports. Perhaps most confounding, Bob has been credited with playing an important part in building TechX into a company that warranted pursuit by at least five different PE firms. And yet, Bob will still be fired.

When Bob finds out, he is understandably apoplectic. He shouldn't be. The writing has been on the wall since the inception of the deal. You see, Bob had already committed one of the seven deadly PE sins: he functions as a capable controller, not a strategic CFO.

We'll explore that original sin and the six others that lead fund sponsors to fire existing CFOs. We'll also explore some of the solutions for those sins—some of which are easier to rectify than others.

Just Keeping the Books | The CFOs who commit this sin have grown up in a controller-style finance department. They excel at bookkeeping and accounting but have neither the experience nor the awareness to recognize the many other hats private equity CFOs need to wear (and wear well). Bookkeeper CFOs lack the strategic sensibility to help scale the business. They don't have the necessary window into funding, nor do they have the operational insights to effectively manage lenders.

Batting from Half Court | From the moment a PE fund purchases a company, the entire game changes. You can't play baseball on a basketball court. Bob will need to adapt to the rules of the new game, and the new (expanded) dimensions of the field. For example, the fund sponsor will demand a new type of financial modeling, often at an accelerated pace. The PE-backed CFO not only needs to be informed and agile enough to build those models, he or she needs to be an effective spokesperson for them.

That requires the CFO to be fluent in the art of managing up, serving as a departmental ambassador (and sometimes translator) to the board and fund sponsor. Those skills are rarely honed outside of a PE-backed environment. In fact, even when the CFO has experience with private institutional funding via venture capital, he or she will find that the reporting rigors of the new PE owner change the landscape dramatically.

Untalented with Talent | On the flip side, some finance chiefs can't manage down. They are equally ill-suited to a PE environment. The transition to PE-backed CFO comes with a significantly expanded portfolio of initiatives. He or she is responsible for not only the traditional functions of finance but also for reporting on a dozen or so financial-reengineering and value-creation programs.

Make no mistake, we're not talking about delegation—that's table stakes.

We're talking about the importance of having a critical and unbiased eye toward talent, the ability to anticipate the next phase in the company's evolution, and the willingness to make changes to the team accordingly. Those who can't build and mentor the right talent to manage multiple work streams will be invited to make an early exit.

Losing the Versus Vote | As with every function, there are tradeoffs and compromises to be made when finding the right executive to fill the PE-backed CFO chair. The fund sponsor will need to make a series of skill-set choices, or "versus votes," as we refer to them.

Two that we think are worth flagging are: (1) rearview vs. windshield, and (2) industry acumen vs. PE experience. With respect to the former, the inherited CFO often comes to the table with significant institutional knowledge and an unparalleled ability to relate current corporate trends to historical patterns. But the role of the PE-backed CFO is much more about making calculated forward-looking assessments than allowing past to serve as precedent.

From the moment a PE fund purchases a company, the entire game changes. You can't play baseball on a basketball court.

As for the latter, while there are some sector-specific exceptions, fund sponsors tend to reward executives with PE-backed experience at the expense of acute industry knowledge. Of course, if an executive possesses both, that's the PE unicorn.

Undisciplined Dreamer | While many inherited CFOs struggle with the shift to a growth mindset, those who come from a venture-backed company struggle to adopt disciplined limitations. The "go big or go home" ethos of venture capital is antithetical to the "at the margins" investment thesis of private equity. Yes, the PE company is seeking significant growth, but it's doing so by making explicit trade-offs for every investment and recognizing the return on every dollar spent.

Rishi Jain

Neel Bhatia

Nick Leopard

While all private capital is categorically similar, the processes of running VC-backed versus PE-backed companies are fundamentally different. So too is the CFO skillset that needs to be brought to bear. For many VC CFOs, that's not an easy transition.

Not Ready for Prime Time | Perhaps the softest skill set to measure and the most difficult to assess is the "CFO X factor." Does the inherited CFO have the polish to represent the company externally? The gravitas to lead a road show and be the ambassador for a firm trading on the public record?

Perhaps more important, if the finance chief doesn't come to the table with those instincts, can he or she learn and adapt? For far too many, the answer is a firm no. For that reason, the existing CFO is often exchanged for an executive with public-company experience.

Being Expendable | Finally, let's get back to Bob. He was fired because he committed the worst of all CFO sins: he was expendable. But Bob is not alone. Of all the C-suite positions, CFOs are the least irreplaceable. Other functions tend to be more plugged into an external network and more rooted in the organization's wiring. The PE firm was looking for a change, and it was easy to fire Bob.

Bottom line: Don't be like Bob.

More often than not, sin is unavoidable—you can't invent experience you don't have. For such CFOs, there are two critical solutions for avoiding Bob's fate:

The Security Equation | There's an inverse relationship between executive insecurity and willingness to accept support. Bob refused much of the assistance the PE fund offered, fearing it underscored his inexperience. But reluctance to accept help doesn't expose deficiencies; it exposes insecurity. And that is the first and most important red flag for the fund sponsor.

CFOs lacking skillsets or experience must know what they don't know and embrace the opportunity to learn (and adapt) on the fly. They must proactively and confidently seek a network of resources (whether internal or external) that can supplement their knowledge gaps. That is best done before a deal is on the horizon.

Call Me Irreplaceable | Before demonstrating a willingness to accept help, CFOs must give themselves the breathing room to prove their adaptability and value to the fund sponsor. Surprisingly, it is the relationships outside the organization, most notably with the board and financial lenders, that can prove most valuable. CFO

Nick Leopard is the CEO and founder, and Rishi Jain the managing director and Western region head, at Accordion, a private equity financial consulting firm. Neel Bhatia is a longtime human capital consultant.

Courtesy the authors

RPA Still 'Scratching the Surface'

More companies are looking into robotic process automation as the technology matures, says an ex-GE finance executive turned RPA evangelist. By David McCann

A year and a half after *CFO* took an in-depth look at robotic process automation (RPA), where does the still-youthful technology stand today? To find out, we turned to a career General Electric finance and technology executive who in February cut the cord and signed on for a key role with RPA vendor UiPath. ¶ GE had been Ashim Gupta's only employer since he graduated from Rutgers University in 2000. By 2013 he was finance chief of the company's water and process technologies unit—where, he says, he "implemented a lot of cool digital tools."

Then-CFO Jeffrey Bornstein took note and, in 2016, asked Gupta to move to headquarters and implement such change "at scale," across the company. Gupta became chief information officer of finance and global operations, which included GE's shared services organization. The marching orders were, "Don't go for incremental improvements. Figure out 'the art of the possible.'"

In that role Gupta took ownership of the company's big-data program for finance and shared services and the company's ERP functionality. He also took over GE's RPA program, shortly after a supply deal was struck with UiPath.

Over the next two years Gupta became intimately acquainted with the subtleties of RPA technology, which in its basic form is designed to automate repeatable processes by mimicking computer keystrokes made by humans that perform the processes. He saw the technology becoming more sophisticated. This year, UiPath hired him as chief customer success officer. (For more on UiPath, see "Digital Remedies," page 29.)

Gupta sat down with *CFO* to provide a new look at where RPA stands in early 2018. An edited version of the discussion follows.

In coming to UiPath, were you motivated most by the new job, or the opportunity to flee GE?
Oh, it's a new adventure. It was really hard for me to leave GE, despite all the chaos there. I had a good network, a great role, and a great life. It's like my family there. But I was at a career point where some new interests were developing. Also, the company moving to Boston [from Connecticut last October] was a turning point.

Why is someone with a finance background a good fit for the role you are taking on?
Finance and accounting is a big space for RPA. And in my finance roles at GE, I very much operated as a COO. My understanding of how various processes connect is an asset for companies that are starting to look at RPA technology and thinking about how to use it to drive returns.

How does the usage of RPA break down between finance-related processes and those outside of finance?
I'd say about 40% is in finance and accounting. The rest is spread across various other processes. Attendant bots within call centers, to record customer information and process forms, are a large piece of the pie as well.

How would you characterize the current extent of RPA's penetration into companies?
Even with the strong growth it has experienced over the past two years, I'd

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say it's still in the early stages. Companies that started using it two years ago have picked off some low-hanging fruit and gotten proofs of concept. Midsize and smaller companies are now looking at it.

At GE, we started by using bots for five processes. The goal for 2018 is more than 200 processes, and we still felt we were just scratching the surface. When you're talking about a shared services organization with more than 12,000 [full time–equivalent employees, or FTEs] crunching millions of transactions daily, it's at a very low penetration rate still.

[Increasing usage] is as much about getting the overall organization's head around the idea that RPA is a tool for everyone as it is about figuring out how to apply it at scale.

What are some of the most sophisticated processes that existing RPA technology can handle if a company wanted to use it for that?

My favorite example is export controls. GE sends a lot of equipment to a lot of countries. That requires dealing with parts classifications for export controls requirements and creating custom forms so the parts can get through countries' customs agents quickly and efficiently.

We've applied RPA for that, together with applying some light artificial intelligence. It's sophisticated because you need to integrate with a lot of applications. The benefits go beyond reducing FTEs, to fewer customs penalties and better on-time delivery to customers.

RPA can also be applied to complex processes like services accounting and classifying contractual risks. Those are things we're experimenting with, with success.

Are RPA vendors themselves developing and providing AI tools, or do you interface with outside tools?

The latter. We're at the early stages of figuring out how to integrate with AI tools like IBM's Watson. But integrating AI with your own data to help bots make better decisions, even in a crude way, is becoming more common. It's within the grasp of a lot of businesses.

Companies that started using [RPA] two years ago have picked off some low-hanging fruit and gotten proofs of concept. Midsize and smaller companies are now looking at it.

It seems that almost every software vendor is touting AI capabilities. Might AI have the potential to swamp RPA out of existence with turnkey products that incorporate both AI and RPA?

It's a risk. But the first rounds of RPA are about developing muscle, and the AI companies I've worked with are more interested in trying to add brainpower than replicating the muscle-building. Who will integrate the brain and the muscle is a larger question than worrying about AI vendors.

Ashim Gupta

You mentioned that even small companies are looking into RPA. What is the opportunity for them?

Small companies do of course have a lesser FTE opportunity than do big ones. But I'll give you a small example. A friend who has a doctor's office is starting to explore RPA; it can make processing insurance claims easier. So even on a small scale, where you don't take out any FTEs but you get more accuracy and efficiency and make a better environment for employees, small businesses can definitely use RPA.

Is RPA a commodity, with the various vendors essentially selling the same technology?

Yes and no. Can companies mimic RPA technology more easily than they can mimic a big-data platform or an ERP? The answer is yes. But developing bots involves some subtle things about interacting with desktop applications.

UiPath, for example, doesn't just mimic application interfaces. For many applications we use the actual user interfaces. The subtle difference there is that it's easier for an accounts payable clerk, for example, to grasp. There are also differences in the scalability of interaction with software and adapting to security requirements.

How much of what RPA vendors provide is product versus service—working with customers to optimally deploy bots?

Most of it is product, because we're dealing with customers at scale. That's why we work closely with distribution partners [like technology consulting firms and professional services firms]. RPA companies have different outlooks on how to spread that distribution of products and services. Some exclusively do product sales and leave all the implementation work to partners.

We do play a part in helping companies succeed in driving implementations, but we do it very selectively. In those cases we ask what kinds of use cases they're looking at and talk about what the roadblocks might be.

Is RPA usually a corporate procurement, or is it more driven by individual business units?

At GE we generally did more centralized purchasing, for two reasons. First, a proliferation of applications creates a lot of complexity in terms of infrastructure and security requirements. Second was GE's big shared-services shop, which highly targeted RPA for a number of processes.

But I'm seeing both approaches; it's probably a 50-50 mix. Both have their merits. CFO

Courtesy UiPath

ACCOUNTING

Justifying Judgment When Recognizing Revenue

Here's how to address challenges when applying FASB's new principles-based model for revenue recognition. By Eric Knachel

The Financial Accounting Standards Board's new revenue recognition standard aims to improve the accuracy and relevance of financial results by shifting from a rules-based model to a principles-based model. That is generally viewed as a positive development, since it gives a company more latitude to reflect the real-world complexities and nuances of its business. However, one significant challenge that arises is the issue of *judgment* versus *consistency.*

Under a principles-based model, companies may use more judgment when deciding how to account for various types of transactions, instead of being forced to apply hard-and-fast rules that might not fit the actual economics of the situation. However, such judgments can vary widely, raising the possibility that different companies will report different accounting results when presented with a similar set of facts.

Although some level of variation may be considered acceptable under the new accounting standard, companies need to tread carefully, making sure their judgments can be justified.

Real-World Examples

There are myriad situations where judgment can influence how a company accounts for revenue under the new standard. Specific examples include the following:

Transfer of control. Under the new standard, product revenue is recognized when control of the product is transferred to the new owner. For example, a publishing company normally recognizes revenue for a book when the retailer accepts delivery. However, publishers often restrict a book from being sold until its official release date, which raises the question of when the transfer of control actually occurs. Is it on the delivery date, when the retailer takes physical custody? Or is it the release date, when the retailer is allowed to sell the book and generate a profit? Under the principles of the new revenue recognition standard, this is a judgment call.

Measure of progress. Although revenue for construction projects is typically recognized based on a project's progress, deciding how to measure progress is also a judgment call. One company might use a physical site assessment to estimate how close the project is to completion. Another might calculate progress based on costs incurred. For example, if a company had purchased the required materials and the cost of those materials represented 40% of the total estimated costs, the project would be considered 40% complete—and the associated revenue would be recognized—even if limited construction activity had yet to occur. Depending on the situation, either of the approaches might be acceptable.

Alternative use. Similarly, when a manufacturer is custom-building something for a specific customer, the timing of revenue recognition may hinge on the concept of "alternative use." If the item being manufactured could be readily resold to a different customer (for example, if the first customer backed out of the contract), then it is considered to have an alternative use, and revenue would be recognized when control is transferred to the customer. However, if the item cannot be readily resold (or used for some other valuable purpose), revenue would be recognized incrementally over the course of the build process.

Of course, judgment comes into

play when deciding whether something can be "readily" resold or redirected for another use. If no additional cost would be incurred to make the product resalable, then the answer is clearly "yes." However, if the required cost of rework would be more than zero, then what is the cutoff point? 10%? 20%? 50%? Since there are no hard-and-fast criteria, this situation calls for considerable judgment.

Managing the Challenge

The first important step is to understand the challenge and acknowledge it exists. Beyond that, here are four steps companies can take:

1. Seek input and clarification from others. Look for guidance from the AICPA, which has established 16 industry groups to help resolve these kinds of difficult accounting issues. Participate in informal peer groups within your industry to try and reach a consensus on the "right" approach (or an agreement that different approaches and answers are acceptable for the issue in question). Tap into auditors and external advisers as sources of valuable input and knowledge, and when appropriate seek guidance from them in getting authoritative direction from the Securities and Exchange Commission and FASB.

2. Consider alternatives. Companies sometimes fall into the trap of applying judgment and then thinking their conclusion is the obvious and only answer. Encourage a healthy and constructive internal debate, focusing on alternatives that best reflect the substance of the transaction. Also, once the company has reached a decision, constantly remind yourself that the answer isn't black and white.

3. Document your judgments. When making decisions and applying judgment, be sure to document your reasoning and judgments along the way. Trying to connect the dots from memory later is a lot less reliable—and a lot less reassuring to regulators.

4. Provide robust and transparent disclosures. Include information in the company's financial statements and related disclosures so readers can

"Companies need to tread carefully, making sure their judgments can be justified."

—Eric Knachel, senior partner, Deloitte & Touche

understand the significant revenue judgments that were made, and the basis for those judgments. This can help foster a better understanding of why a particular accounting treatment was used, and how revenue numbers compare with those of other companies.

Although the new revenue recognition standard allows a significant amount of judgment, that does not mean any and all judgments are acceptable. Different judgments might be acceptable in some cases, but for other instances similar facts should result in similar judgments. CFO

Eric Knachel is the senior consultation partner for revenue recognition at Deloitte & Touche LLP.

Help With Non-GAAP

The Center for Audit Quality recommends best practices for non-GAAP presentations.

The use of non-GAAP metrics remains under close scrutiny by regulators, even while investors and analysts lean ever-more heavily on the measures. With that backdrop, the Center for Audit Quality undertook a mission to educate audit committees on leading practices for exercising their roles as overseers of companies' financial reporting.

CAQ held three roundtable discussions in 2017, each with a diverse roster of 20 to 25 participants that included audit committee members, management, investors, lawyers, and auditors.

The result of the conversations was a concise document, "Non-GAAP Measures: A Roadmap for Audit Committees," that was released in March. Of direct interest to CFOs are some recommended best practices:

Disclosure controls | Establishing disclosure controls specific to non-GAAP measures could enable companies to mitigate risks, support sound decision-making on their reporting, and drive more consistency and transparency in preparing and presenting the metrics, CAQ says. The controls should be documented and robust enough to facilitate testing.

Non-GAAP policies | Companies should establish a set of guidelines to follow when preparing and presenting non-GAAP measures. Guidelines can, for example, help in deciding on the treatment of new transactions or events within non-GAAP measures.

Audit committee disclosure | There was no consensus among roundtable participants on whether disclosing non-GAAP policies, or even merely disclosing that the company has one, would be a good practice. "Given the current regulatory environment and the fact that non-GAAP measures are important to investors, there could be benefits to an audit committee voluntarily disclosing that the company has non-GAAP policies (but not necessarily the relevant details of those policies)," the report states. | DAVID McCANN

Courtesy Eric Knachel

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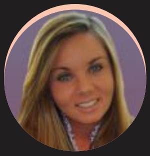

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Screen Actors Guild and the
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Tech Companies To Watch 2018

Digital Remedies

These 20 vendors offer compelling products that address longstanding points of pain for enterprises.

Because IT investment is clearly ramping up, hordes of tech companies are vying for mind-share. Seeing through the blizzard of pitches to discover the really compelling, difference-making solutions is difficult.

That's why we bring you the second annual edition of *CFO*'s Tech Companies to Watch. In assembling this roster of 20 vendors, we uncovered a breadth of technologies that would be valuable to finance chiefs. At the same time, we also discovered a wealth of innovation going on in "traditional" finance-related tech categories. ➔

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For example, organizations looking to improve their hiring processes (and who isn't?) will want to experiment with a talent acquisition tool that we unearthed. Executives in need of a virtual assistant to schedule meetings (without creating a yards-long trail of emails) will find a solution also. How can a blockchain-based product reduce corporate paperwork? There's a company on the list addressing that too. If those solutions sound too exotic, rest assured the list also includes the latest and greatest in accounts payable automation, corporate performance management, and other classic, vital categories.

Testing the quality and reliability of these companies' products is beyond our capabilities. But the descriptions on the following pages should provide a clear idea of whether these tools deserve a closer look—and maybe merit being part of your organization's digital transformation.

The company profiles were written by freelance writers Keith Button and Bob Violino; deputy editor David McCann; and editor-in-chief Vincent Ryan.

PYMETRICS
Matchmaker

Data seems to be the backbone of most corporate decision-making these days, so why not throw the hiring process into the mix? Pymetrics, a growing startup that landed its first clients in 2015, is on a mission to displace the résumé as the first point of contact between a job candidate and a potential employer. Why? Because, Pymetrics says, résumés trigger biases in those reviewing them and hinder employers from hiring the best candidates for the job's duties.

Here's how the Pymetrics process works. First, a client company decides what types of positions it wants Pymetrics to help it fill. Then the company selects at least 50 of its existing best performers in each of those role types to play a series of 12 online test games. (The games are based on well-established neuroscience research.) Instead of answering questions, the employees engage in various activities designed to assess cognitive and emotional traits like risk tolerance, reaction time, pattern recognition, impulsivity, focus, memory, and fairness.

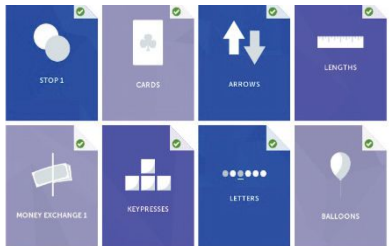
Pymetrics

Product category: Talent acquisition software
Year founded: 2013
Headquarters: New York
Employees: 65

Marie-Eve Piche, CFO of Pymetrics

Then, candidates for the positions the Pymetrics client is trying to fill play the same test games. Finally, artificial intelligence algorithms match up the traits displayed by the client's star performers with those exhibited by candidates to determine which job seekers are best suited for particular roles.

"We believe there are multiple roads to success and multiple kinds of intelligence," Pymetrics CFO Marie-Eve Piche tells *CFO*. "What makes a great accountant is very different from what makes a great salesperson. Having perfect grades and test scores does not mean you're a perfect fit for all jobs."



Pymetrics test games

"We believe there are multiple roads to success and multiple kinds of intelligence," says Piche.

By applying artificial intelligence to the test results, she adds, Pymetrics "can filter through thousands of data points, whereas someone looking at a résumé can only pick up on a few." Hiring biases related to a candidate's name, age, previous employers, and colleges attended can be overcome via the system.

A person could be a great fit for a role he or she has never had before, notes Piche. That's important today, as employers typically believe there aren't enough qualified candidates for their vacant positions. "Résumés reflect only past information, so they don't help in those situations," the CFO says.

The requirement that clients have 50 high performers in each role to be filled play the test games is necessary for building the behavioral profile that correlates with success in that role. That means Pymetrics is targeting large companies—clients include Accenture, Burger King, and Unilever—but not *just* large ones. For example, even midsize companies commonly have call-center staffs numbering in the hundreds.

Interestingly, the test games are not tailored to specific role types. Every candidate for any position plays the same 12 games.

While Piche notes that Pymetrics is growing fast, collecting enough data to be confident that good results can be replicated over time requires patience. To date the company has worked most extensively with Unilever, and very successfully, she says. "But people are asking us, 'What will it look like five years down the line?' We don't have that information yet."

Courtesy Pymetrics

Squeezing bias out of the hiring process serves a social purpose as well as a business one, of course. Under a partnership with the Rockefeller Foundation, four companies have agreed to use Pymetrics to find job candidates from pools of unemployed young people.

And selling companies on a brand-new way of doing something is always a challenge, especially when it's an activity that's steeped in traditional practices. But with many companies reinventing their business models, the climate might just be right for open-minded thinking on the talent-acquisition front. **DAVID McCANN**

PRATTLE

Figuring Speech

What corporate executives say during earnings calls matters, obviously. That's why sentiment analyses exist: investors want to gauge whether the language CEOs and CFOs use on a call is positive, negative, or neutral. But Prattle, a small company that's starting to make a big splash in the investment research arena, is providing what could be characterized as "sentiment analyses on steroids."

In late 2016, Prattle launched its first product: an advanced analysis of speeches and other communications by the U.S. Federal Reserve and 19 other central banks. Its clients—asset managers, hedge funds, investment banks—use the data to guide their investment decisions.

Prattle's algorithms calculate positive or negative scores in terms of their predicted impact on subsequent short-term market movements of various asset classes. The analysis looks at words, sentences, phrases, and the relationships between them to generate a score indicating the speech's relative dovish or hawkish quality.

Prattle

Product category: Automated investment research
Year founded: 2013
Headquarters: St. Louis
Employees: 20

Brian Peterson, COO of Prattle

That's not all. Using machine learning and natural language processing, Prattle analyzes how the language patterns in a speech differ from those the speaker used in previous addresses. The analysis tracks how markets moved after the earlier speeches and, if language patterns are different in the new speech, adjusts the expected market movements accordingly. With each new speech the algorithms are designed to grow more accurate, says Brian Peterson, Prattle's chief operating officer and de facto finance chief.

An example of a language subtlety that Prattle takes into account involves usage of the words "moderate" and "modest." How people use those words makes a huge difference in financial markets, according to Peterson. "In a straight-up sentiment analysis, they could both be positive and they'd have the same weighting," he says. "But in financial market settings, they can have significantly different meanings."

Federal Reserve

Prattle upped its game considerably last September, when it began selling access to analyses of the earnings calls of 3,000 U.S. companies.

Prattle upped its game considerably last September, when it began selling access to analyses of the earnings calls of 3,000 U.S. companies that had been publicly held for at least four years. The data has revealed some interesting trends. For one, when a company's CFO speaks for a larger percentage of the call, compared with the CEO, there is less short-term volatility in the company's share price. The trend holds true for both positive and negative volatility.

Prattle's methodology seems to be on the money. A third-party research firm, Lucena Quantitative Analytics, performed portfolio backtests using Prattle data to guide trading strategies. The backtests, which factored in realistic trading conditions such as transaction costs, involved "buying" stocks of companies that Prattle scored as positive and holding them for one month before "selling."

Applying that strategy to stocks included in the Dow Jones Industrial Average from the beginning of 2013 through mid-September 2017 resulted in a 112% return premium over the Dow's actual performance. The same strategy, applied to Russell 1000 stocks from the beginning of 2012 through mid-September 2017, scored a 44% return premium. The Sharpe ratios for the two portfolios, representing risk-adjusted return, were 1.33 and 1.46—"huge returns over the benchmarks," says Peterson.

"At its core, the typical sentiment analysis takes all the positive and negative words in a communication, and the net difference is the score," Peterson says. "Our version is much more mature."

Prattle may not need many clients to profit from its groundbreaking products. The company's main assets are the algorithms, and they are developed and refined by a small number of people. Startup funds were negligible, although last year the company landed $3.3 million in seed funding for its expansion into equities. Now the company is working toward expanding its analyses to company press releases and stocks listed internationally. **D.M.**

Top, Wikipedia; bottom, courtesy Prattle

TIPALTI

Payables Specialist

What company doesn't want to improve its working capital? One step toward that goal involves seeking efficiencies in accounts payable processes. But the area has been somewhat neglected, especially for companies that don't have the capital to piece together best-of-breed treasury management solutions or invoice processing systems.

Instead, their overworked accounts payable staffers type in supplier information manually, collect tax forms via email in a mad scramble at year-end, and log-on to five or six bank portals to execute payments. Even the "top performers" in a benchmarking analysis from AQPC have to manually key in 42% of their invoices.

Tipalti

Product category: Accounts payable automation
Year founded: 2010
Headquarters: San Mateo, Calif.
Employees: 118

Chen Amit,
CEO of Tipalti

It's a void in automation that Chen Amit, co-founder and CEO of Tipalti, saw as an opportunity. "Midmarket companies don't have the resources to go all out solving this problem," Amit says, and instead do what they would rather not—throw more and more people at accounts payable. Even large companies have this problem: some are using as many as 22 full-time-equivalent employees in AP per $1 billion of revenue, according to APQC.

Tipalti (Hebrew for "I look care of it") is a global payables automation solution that claims it can automate 80% of the work. The product isn't the only horse in the running, but it seems better-equipped and more enterprise-ready than services like Bill.com.

Tipalti's open API application allows users to make payments across 190 countries and in 120 currencies, and those users can offer suppliers six different forms of payment (PayPal, prepaid debit cards, wire transfer, U.S. ACH, global ACH, and local bank transfer).

The Silicon Valley firm has racked up many big-name tech clients, including Amazon, GoDaddy, Roku, Indeed, and Twitter. And its solution seems to be scaling well: men's fashion website Touch of Modern implemented Tipalti when it had $6 million in revenue; it's still using the platform at $150 million in revenue. And, according to Robert Israch, Tipalti's chief marketing officer, the company has not hired another AP person since adopting Tipalti.

About 250,00 payees use the Tipalti platform, and it has processed as much as $4.5 billion of payments in a year. It's particularly suited to multi-entity organizations.

"I think you need to have a few hundred payments a month to start feeling the pain. If [the volume is] smaller than that, your admin or your accountant will be able to handle the burden, but once you hit a few hundred a month, then it becomes too risky, painful, and expensive," Amit says.

A key to Tipalti's success is the ease with which a client's suppliers can sign up. The system also provides visibility into a payment's status and notifies suppliers when their payments go out. A wizard walks suppliers through tax forms. And if a supplier wants to change payment methods, no work on the part of the payer is required.

For clients, setup can be fast, says Amit. Some organizations can sign up on a Monday and make payments on the platform by Friday. The more complex implementations take longer. Twitter, for example, uses "every bell and whistle that Tipalti offers," and implementation took six weeks from the time Tipalti won the request for proposal to when Twitter made its first payment on the system.

"Midmarket companies don't have the resources to go all out solving this problem," says Amit.

Tipalti raised $30 million in a series C round in February, which should help in defending its market territory by finding areas to add value. The company introduced a purchase order matching capability in January that adds machine learning on top of invoice processing.

For being a leader in automating a large chunk of the payment workflows, Tipalti merits watching. **VINCENT RYAN**

UIPATH

Hot Bot

There's been a triad of leading vendors since the term robotic process automation (RPA) was coined several years ago: Automation Anywhere, Blue Prism, and UiPath. Last year *CFO* named Automation Anywhere a "tech company to watch" because prospects for RPA were soaring and Forrester Research had recently ranked the company first in three important categories: strength of technology, strategy, and market share. This year, things may be shaping up differently. Prospects for RPA are still soaring, but in particular UiPath's star appears to be on the rise.

UiPath says it will "easily" have 1,500 enterprise customers by the end of 2018.

While all three leading vendors are experiencing strong growth, UiPath's leap over the past 12 months has been eye-popping. In early 2017

Courtesy Tipalti

the company had fewer than 100 enterprise customers for its robot-building software platform—putting UiPath far behind its major competitors. But that number has since swelled to more than 700.

Officials at the Romania-based company claim it will "easily" have 1,500 enterprise customers by the end of 2018. They also say it has become "the most widely adopted enterprise RPA platform." However, cautions Forrester analyst Craig Le Clair, "We have no way to reliably assess that."

Like many RPA vendors, UiPath is increasingly hampered by the limited number of companies qualified to implement RPA platforms—third parties, like Accenture, Deloitte, and Ernst & Young. UiPath, though, has a singular approach to mitigating the problem. The company offers free downloads of its platform for individuals, companies with less than $1 million in annual revenue, and educational organizations. Anyone who downloads the platform is not only a potential future paying customer but also a potential future implementer—and, according to UiPath, during 2017 there were more than 125,000 downloads.

UiPath

Product category: Robotic process automation
Year founded: 2005
Headquarters: Bucharest, Romania
Employees: 600

Daniel Dines,
CEO of UiPath

"With free online training available from our UiPath Academy, the response has been tremendous," says company founder and CEO Daniel Dines. More than 36,000 people registered for courses last year.

Dines, says Le Clair, is "a very smart guy who has created a good culture within the company." That culture values being straightforward and generally not overpromising what can be delivered. The company offers "a very strong platform," according to Le Clair, who last year rated its technology as second-best in the RPA field, a hair behind Automation Anywhere. Le Clair says UiPath "may do better" in his 2018 report on the sector.

The UiPath Studio platform is especially touted for its ease of use. It's based on Microsoft's Windows Workflow Foundation, which gives users "a highly intuitive, Visio-like process automation experience," says Dines. The company's best-known differentiator is Computer Vision, a product that allows customers to automate Citrix virtual machine environments quickly and precisely.

Investors have taken notice of the pluses. In March UiPath announced a Series B funding of $153 million led by Accel Partners—which solely provided the $30 million the company secured in its first funding round, in 2017. Google investment arm CapitalG was one of two other venture capital firms that supported the Series B.

Much of the cash infusion will be used to develop machine learning and artificial intelligence capabilities, says UiPath. That could help the company in a potential future battle between RPA and AI vendors to provide turnkey products integrating both types of automation.

"[Leading] AI companies typically have higher valuations and are better financed than the RPA companies—with the exception, now, of UiPath," says Le Clair. **D.M.**

EXABEAM

Threat Spotter

Organizations are looking for any advantages they can find to better defend themselves against increasingly sophisticated cyber criminals and other security threats. One avenue that's become essential to good security is leveraging data and the latest analytical tools to detect and thwart attacks before they do damage. Five-year-old Exabeam is one of a number of companies aiming to help customers do just that. The company offers security intelligence and management products that support threat detection and security incident response.

The Exabeam Security Intelligence Platform combines a data lake for unlimited data collection, machine learning for advanced analytics, and automated response "playbooks" for handling the many kinds of security incidents that enterprises experience. The market Exabeam plays in is called security information and event management (SIEM), and Nir Polak, Exabeam CEO, considers the other products in the market to be "broken."

Exabeam

Product category: Security information and event management
Year founded: 2013
Headquarters: San Mateo, Calif.
Employees: 190

Nir Polak,
CEO of Exabeam

"They charge by the volume of data being stored, effectively penalizing customers who are trying to be more secure," says Polak. "They are notoriously inaccurate, creating literally hundreds of false alarms every day. That wastes the time of valuable [IT] employees. And they only find problems; they don't automate."

Exabeam charges a flat rate based on company size, not data volume. It contends that applying machine learning—the same technology that has enabled advances in autonomous driving—to cybersecurity provides more accurate information for busy security analysts.

Given the massive volume of events that are logged at

Courtesy the companies

Tech Companies to Watch 2018

companies because users access corporate networks multiple times a day from several devices, humans can't keep up, Polak says. "We need machine intelligence to lend a helping hand," he contends. And with the shortage of security talent, anything that enables organizations to automate and repeat standardized processes can help, he says.

Apparently, the security marketplace agrees with Exabeam's approach. The company concluded a record year in 2017, with billings growing 250% over 2016.

The company debuted in the 2017 Gartner SIEM Magic Quadrant as a "visionary" vendor. One of Exabeam's strengths, Gartner said, is that its architecture is "big-data oriented" and it supports a variety of deployment options (including on-premises, infrastructure-as-a-service, and hybrid).

That's not to say there aren't challenges lying in Exabeam's path. For example, IBM, Hewlett-Packard Enterprise, Intel Security, and Splunk are all competitors, and that's not even a complete list. "We are taking on a big market, with established players, so we have to execute," Polak says. "We also need to hire a lot of good people, and the hiring market is tight right now. But usually, when people hear about our growth and tech, their eyes light up."

"Every day we have hard, honest discussions to help us fix problems and move ahead faster," says Polak.

Exabeam was built by seasoned security and enterprise IT veterans from companies such as Imperva, ArcSight, and Sumo Logic. Their collective industry knowledge has created a company culture of continuous innovation and collaboration, Polak claims. "We are also a very transparent culture," he says. "Every day we have hard, honest discussions to help us fix problems and move ahead faster."

With cyber criminals adapting quickly to enterprise defenses, moving swiftly will be important. Up next for Exabeam: "tightening integrations within the platform, enhancing the user experience, and increasing emphasis on the cloud," Polak says. **BOB VIOLINO**

X.AI

Executive Assistance

Everyone has a digital assistant, whether it's Siri, Alexa, Cortana, or the less endearingly named Google Assistant. But what they can effectively help you with is limited. That's why an iPhone, for example, offers access to a store with 2.5 million apps in addition to Siri.

The key to an effective digital assistant is specialization, and that's what's driving a wave of new digital assistants focused on completing specific tasks very efficiently. A company to watch in this area is x.ai. Why? Think about a task you perform in your job often enough that it robs some of your productivity. How about scheduling meetings and phone calls? X.ai has created an artificially intelligent digital assistant to significantly reduce the time spent on that activity.

x.ai

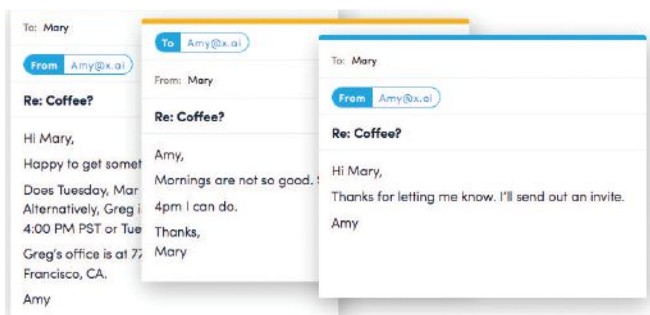
Product category: Digital assistant
Year founded: 2014
Headquarters: New York
Employees: 53

Dennis Mortensen, CEO of x.ai

A user simply creates an email with brief instructions—whom to meet with, when and where, and in what medium. He sends it to the digital assistant, which is linked with his activity calendars and will know when he is available. The assistant, called Amy Ingram or Andrew Ingram (user choice), will then handle most of the subsequent details: contacting other meeting participants, responding to requests for information, and rescheduling meetings if necessary.

It may sound simple, but actually it's not. Company founder and CEO Dennis Mortensen employed dozens of programmers over four years to figure out how to use machine learning to make the system work. Efforts to commercialize the product didn't begin until mid-2017. "If every human being were extremely rational and wrote without any ambiguity, the whole thing would be a lot easier," Mortensen says. But of course, they don't. They lack clarity, and use slang and idioms.

As an example of a problem Amy must solve, imagine you're working late and send an email to someone after midnight asking to chat "first thing tomorrow." Amy has been taught to understand that, when humans say that, they



"Amy is among a set of highly specialized, vertical AI assistants that do only one thing, but do it extremely well," says Mortensen.

Courtesy x.ai

don't mean 24 hours later; they mean 7 or 8 hours later. "And there are tens of thousands of examples like that," says Mortensen. There is, of course, a failure rate, but humans scheduling meetings make mistakes too, he points out.

Mortensen says he got the idea for the service after he sold his previous software company and recalled spending an enormous amount of time the year before the transaction setting up meetings. "I went back into my calendar, and it was a staggering amount: 1,019 meetings in that one year, 2012," he says. "Even sadder, there were 672 reschedules."

On average, he says, setting up a meeting between two parties requires about 3.5 emails on each end. It takes just under 5 minutes per email to open it, read it, flip to another tab, open a calendar, check availability, and craft a reply email. So, each person spends about 15 minutes on scheduling a meeting. If a company is paying a salary of $65,000 to someone who schedules an average of 10 meetings per week, each month it costs the company $300 worth of the person's time to just schedule meetings.

Mortensen plans to add languages other than English, but he's not yet thinking about branching out beyond scheduling meetings. "Amy is among a set of highly specialized, vertical AI assistants that do only one thing, but do it extremely well," he says. **D.M.**

EMAGIA

Alexa's Rival

If you've never heard of Emagia, you have plenty of company. For more than a decade, Emagia has been delivering order-to-cash automation platforms for global finance. Its flagship product, Enterprise Receivables Management Suite, automates the management of credit, receivables, collections, deductions, cash flow forecasting, cash application, and billing and payments for large global companies.

Emagia

Product category: Order-to-cash automation
Year founded: 1998
Headquarters: Santa Clara, Calif.
Employees: 50

Veena Gundavelli, CEO of Emagia

And the company's Advanced Analytics for Receivables offering provides pre-packaged descriptive, predictive, and prescriptive analytics for managing the credit-to-cash cycle and customer payment behavior. But that's not why *CFO* is naming Emagia a tech company to watch.

Emagia says it aims to maximize the financial performance of its customers by driving efficiency and intelligence in finance operations through the use of new and emerging technologies. To wit, in 2018 Emagia introduced Gia, a digital finance assistant that leverages artificial intelligence. Gia offers cognitive and human-like conversational AI and computational AI capabilities, along with continuously evolving job skills to perform specific tasks related to finance operations.

Emagia's Gia

"AI has to be trained on specific use cases and becomes better with time. Managing [the need for] instant gratification is a challenge," says Gundavelli.

The software platform is designed to help finance executives, shared services teams, and operations staff by increasing efficiency and enhancing decision support in areas such as credit, order entry, receivables, payables, and treasury.

Finance chiefs, for example, can ask Gia for an update on the week's total cash received in North America. Gia can "provide quick information and perform repetitive tasks," like providing an accounts receivable update on a large customer. Gia can send to or retrieve information from SAP, Oracle, PeopleSoft, Teradata, and other systems.

A subsidiary of India's publicly held Technvision Ventures (formerly Solix Technologies), Emagia has seen rapid growth both in customer base and revenue, according to Veena Gundavelli, founder and CEO. The company has seen expanded sales and distribution around the world with technology partners such as Conduent, Cognizant, TechM, NTTData, Trianz, and Solix.

One of the biggest challenges Emagia has is servicing fast-growing product deployments efficiently, Gundavelli says. To keep pace with growth the company continues to forge partnerships with global systems integrators.

Another challenge is finding and hiring people with AI skills at a time when demand for such talent exceeds the supply. "To address this gap we have partnered with institutions such as U.C. Berkeley and top-class engineering institutes in India," Gundavelli says. "We also have a strong upskilling program for our engineers."

Finally, managing the hype surrounding AI can be difficult. Many mistakenly consider the technology a remedy for all business problems. "AI has to be trained on specific use cases and becomes better with time," Gundavelli says. "Managing [the need for] instant gratification is a challenge."

Emagia understands that it has to remain innovative in order to succeed. It not only faces competition from other

Courtesy Emagia

fintech companies, it also has Microsoft, Google, and Amazon nipping at its heels, as they are giving Cortana, Google Assistant, and Alexa, respectively, capabilities suited to businesses. So far, though, Alexa can only perform general tasks such as setting appointment reminders, controlling conference room settings, or notifying IT of an equipment issue. Cortana's use cases, too, are relatively simple. But both organizations, as well as Google, are aiming to build an application ecosystem around their products.

Whether Emagia can take full advantage of its head start is an open question. Everyone in Emagia "is motivated by the fact that our [products] drive financial efficiency for our customers in their business operations," Gundavelli says. "We describe our culture [as being] 'entrepreneurial and customer centric,' characterized by innovation, creativity, calculated risk-taking, and empowered associates. And we focus on providing a positive customer experience before and after the sale." **B.V.**

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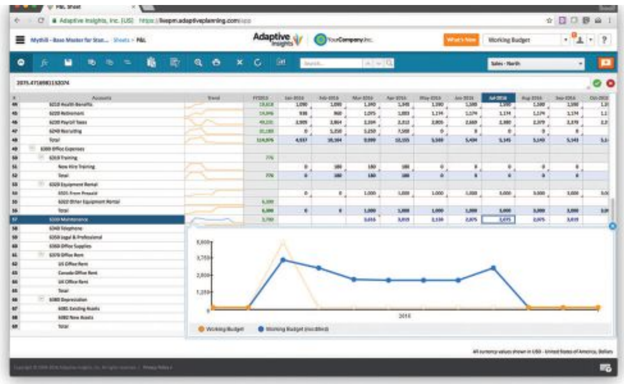


"If you're trying to run a large business-planning process on Excel ... you really don't have time to step back and say 'Let's do this differently,'" says Johnson.

ADAPTIVE INSIGHTS

Spreadsheet Slayer

In the eyes of Jim Johnson, CFO of Adaptive Insights, the software-as-a-service (SaaS) company is accomplishing nothing less than putting financial planning and analysis into the hands of the masses, or at least the executive team members of its customers.

Most CFOs and CEOs would agree, Johnson says, that the people in a company who are closest to the business are best at planning. "Finance typically runs the process, but it's a collaborative process across the company, and it should be," he says. "All the executive staff members want to be more involved in the planning process. They don't want it to be a finance exercise where they get a spreadsheet and they're asked to input a bunch of numbers and send it back. They want to participate; they want to see the [key performance indicators]; they want to see how the plan develops and evolves."

Adaptive Insights

Product category: Corporate performance management
Year founded: 2003
Headquarters: Palo Alto, Calif.
Employees: 500

Jim Johnson, CFO of Adaptive Insights

The appeal of cloud-based planning software like that from Adaptive Insights is that it allows for collaboration. Without the cloud, it isn't possible to build planning models that are powerful enough or that can refresh all relevant data, Johnson says. "You can't be collaborative in a spreadsheet environment; you have individuals with a model on their laptop doing a piece of the work. It's just not possible to interconnect all of those pieces effectively, to keep them up-to-date," he adds.

Adaptive Insights is riding an impressive growth streak with its Adaptive Suite product. Deloitte named the company to its 2017 Technology Fast 500 Ranking—its fourth straight year on the list—as Adaptive tripled revenue between its 2013 and 2016 fiscal years. In its fiscal year ended Jan. 31, the company passed the $100 million mark for annual recurring subscriptions under contract.

Gartner's 2017 Magic Quadrant report for cloud-based corporate performance management software rates Adaptive Insights among the market leaders—along with Anaplan, Host Analytics, and Oracle—with customer satisfaction in the top quartile and high scores for sales execution and cloud experience.

The biggest challenges for Adaptive's growth come from potential customers who don't want to give up their Excel spreadsheets, Johnson says. In fact, on user review website G2 Crowd, some customers complain of a lack of integration between Adaptive and Excel, saying that exporting out of Adaptive to Excel requires manual intervention.

Says Johnson: "There's a characteristic among finance people who like to control things that says: 'I've always done it this way, I'm in control, and I know how to do it.' There's a little bit of inertia around change. It's almost self-fulfilling: If you're trying to run a large business-planning process on Excel, you spend so much time on modeling, consolidation, fixing errors, and getting things updated that you really don't have time to step back and say 'Let's do this differently.'" More frequently on G2 Crowd, users comment

Courtesy Adaptive Insights

on how Adaptive cuts budgeting and forecasting time and makes what-if scenario planning easy.

Adaptive is focusing its growth strategy on four areas: growth through verticals; growth internationally, which accounts for about 20% of its revenue; improvement of scalability features, to win large enterprises; and expansion into sales planning.

That last growth area is a natural progression for Adaptive, because sales operations are such a key part of a company's overall business and financial planning, Johnson says. "The sales component is the most complicated and the hardest to keep aligned with the financial plan, because you're typically modeling at a detail that's significantly deeper," he says. **KEITH BUTTON**

DUO SECURITY

Easier Authentication

Duo Security, a cloud-based cybersecurity company, dispenses with the traditional points of access control: at the network level and on users' devices. Instead, it places tools between the user and the corporate application to verify users' identities. For example, with Duo's multi-factor authentication product, when a user logs in he must approve push notifications to his smartphone or enter a time-based, one-time passcode. That means Duo's corporate clients have less of a need for bolt-on security products for wired networks, Wi-Fi, laptops, or mobile devices, says Jon Oberheide, co-founder and chief technology officer of Duo.

The company, which surpassed $100 million in annualized customer subscription revenue in 2017, is capitalizing on a changing focus in the cybersecurity market, from bolted-on to built-in security tools. The trend—deploying security measures and control at the access layer instead of the network layer or on the end points—will have a dramatic effect on the cybersecurity market, customer budgets, and tools deployed and retired over the next 5 to 10 years, Oberheide says.

"The traditional data center and corporate network are becoming less and less relevant," he explains. Access is happening directly on mobile devices, sometimes over public Wi-Fi, to a cloud application, he points out. "Your corporate network doesn't play a big role in security anymore."

Duo Security

Product category: Cloud-based access security
Year founded: 2010
Headquarters: Ann Arbor, Mich.
Employees: 600

Jon Oberheide, CTO of Duo Security

Duo's mobile authentication

"Your corporate network doesn't play a big role in security anymore," says Oberheide.

The end points are changing cybersecurity's focus also. "The devices we have in our hands, our iOS and Android devices, are more secure than the end devices [the National Security Agency] had four years ago," says Oberheide.

Duo is able to check the "security health" of a mobile device attempting to sign on to an application and block the device (and tell the user to update the device) if it's deemed risky. It can also designate some devices as "trusted" so they can get faster access. In addition, customers can see a dashboard that shows whether the device has unapproved software on it, if a passcode is set, and other attributes.

With more than 10,000 customers—including Altegra Health, Bolton NHS Foundation Trust, Etsy, Facebook, the University of Michigan, and Yelp—the company handles more than 300 million user authentications per month.

Duo's pitch to chief financial officers: its product is easy to deploy, can replace several other security tools at once, and is hospitable to employees or contractors who bring their own devices to work, says Sydney Carey, Duo's CFO. The company boasts a Net Promoter Score—a measure of customer loyalty—of 68. (An NPS above 50 is considered excellent.)

It's not uncommon for Duo to deploy its tool for a client with 7,000 to 10,000 users over a weekend, Carey says, and easy deployment means faster return on investment due to fewer requests for help-desk support and the potential displacement of other security measures. Some clients have replaced several of their point products—such as mobile device management tools, strong authentication, single sign-ons, and network access control software—by implementing Duo.

Duo customers commonly buy the application when they're upgrading or moving their IT systems, or parts of them, to the cloud. "We're kind of riding that wave of cloud transformation to help drive our business," CFO Carey says. News of data breaches, especially when the breach happens at a peer company, is also a big motivator for new Duo customers.

To continue growing, Duo is taking a "land and expand" approach: get a customer that buys a Duo app for a limited

Courtesy Duo Security

number of users to like it so much that it deploys the app company-wide. Duo is also focusing on enterprise customers—those with more than 5,000 employees. They make up about half of Duo's business currently.

"We used to essentially build castles for our security programs—build really high walls and hope that nobody ever got inside," Oberheide says. "Companies made lots of investments in security products, built really strong castles. But many of those existing security investments don't bridge to the new world." **K.B.**

SYMBIONT

Building on Blockchain

A lot of people talk about applications for blockchain like they talk about renovating their basement: the talk doesn't result in much action. But Symbiont, a startup, is earning revenue and actually succeeding in applying blockchain to specific, concrete problems in the world of finance.

Blockchain is the much-hyped, digital distributed ledger technology that records transactions chronologically and publicly without a central administrator. It powers the cryptocurrency bitcoin, but many entrepreneurs are trying to adapt it for other business uses.

Symbiont

Product category: Blockchain and smart contracts
Year founded: 2013
Headquarters: New York
Employees: 38

Mark Smith,
CEO of Symbiont

When one of the founders of Symbiont, CEO Mark Smith, first set out, he was looking for a technology to solve some of the market weaknesses exposed during the 2008 banking crisis. Among them were the dangers of counterparty risk. "We were looking for a way to bring markets back to their natural state, which is decentralized and distributed," says Smith.

After having blockchain explained to him by mathematicians, Smith realized it presented an opportunity to build "peer-to-peer markets in which you don't have to have an intermediary and can create true transparency without counterparty risk."

By 2014, the company was developing what Smith calls "a novel and purpose-built" proprietary blockchain and smart contracts solution for certain areas of the capital markets. (A smart contract is a computer protocol designed to digitally facilitate, verify, or enforce the negotiation or performance of a contract.) Four years later, Symbiont's traction with blockchain applications for corporations is somewhat startling.

In August 2017, Delaware passed a law (which Symbiont helped write) recognizing blockchain as an acceptable form of recordkeeping for Delaware-registered corporations. They can issue shares and manage ownership records using Symbiont's blockchain technology. Delaware's integration of its systems with Symbiont is still in progress, but when complete it will enable end-to-end automation of corporate securities administration, from inception to maturity.

Symbiont is also "on a very long roadmap" with index fund giant Vanguard Group to develop several blockchain products. The first is an effort to automate the distribution of equity index data. When Vanguard receives information about corporate actions that requires it to rebalance its passive funds, the process requires "massive amounts of internal reconciliation, and is fraught with errors due to the use of database replication and screen scraping," says Smith. Successful distribution with the Symbiont blockchain has already been tested for two quarters with data provider CRSP.

"We were looking for a way to bring markets back to their natural state, which is decentralized and distributed," says Smith.

Finally, Symbiont, along with several partners, has tested a working solution to automate the servicing of syndicated loans. With blockchain, in theory, a syndicated loan facility could be supported from origination to payoff. Besides involving multiple participants on a peer-to-peer basis, "a [syndicated] loan is a living instrument—cash-flow payments change from month to month, for example," says Smith. "It's a homerun for blockchain and smart contracts."

Symbiont has plenty of competitors in the race to realize the promise of blockchain. They include the IBM Hyperledger project and even the bitcoin and ethereum blockchains. But many of the open-source projects, in particular, are "not ready for prime time in financial markets," says Smith.

Indeed, Symbiont's biggest battle may be in just getting executives to understand what blockchain is (only 3% of CFOs claim to) and to "fight misrepresentations in the media and in general." Says Smith: "Many people way overstate what blockchain technology can do—almost like it's a snake oil, which it's not."

The rash of initial coin offerings of cryptocurrencies, which Smith calls "a horrible black eye on our ecosystem," is another obstacle. "Now when you talk about blockchain or bitcoin, it gets lumped in with those ICOs, and we're back to where we were in 2013, when we were trying to convince everyone that bitcoin wasn't just for criminals." **V.R.**

Courtesy Symbiont

10 More Worth Watching

THE FOLLOWING COMPANIES ARE STRIVING TO BE MAJOR DISRUPTORS IN SOME KEY ENTERPRISE TECHNOLOGY CATEGORIES.

1. Catalant Technologies

CATEGORY: On-demand business expertise

Consultants may spend days or weeks learning about a client's industry or project type. Catalant, launched in 2013 as HourlyNerd.com, matches subject-matter experts with organizations in need of specific expertise. The company uses a "smart matching algorithm" to scan its 50,000-expert database and make recommendations. A dashboard lets users find out more information on candidates, as well as schedule interviews and compare proposals. Post-engagement, they can rate an expert's performance.

2. Signifyd

CATEGORY: Fraud protection

Like other kinds of cyber attacks, e-commerce fraud is a deepening problem. Signifyd offers an antidote with an eyebrow-raising feature: Customers—online retailers—are guaranteed 100% payment on pre-approved customer orders, even when a credit-card provider demands a charge-back. There's a complete shifting of responsibility, as Signifyd (not its customers) decides whether to approve each order, based on the plethora of data sources it mines.

3. Host Analytics

CATEGORY: Corporate performance management

This top-tier provider of cloud-based CPM solutions still hasn't pulled the trigger on its long-expected IPO, but perhaps its latest gambit could unlock the earnings it needs to go public. Dubbed "Project Orion," it's the first enterprise performance management system designed for business users rather than finance professionals.

4. Spoke

CATEGORY: Communications

A startup in the truest sense, Spoke was gearing up for general availability of its product in early April, following pilots. The workplace request platform simplifies internal ticketing for everyone from IT to HR. It uses AI and natural language processing to route and resolve internal requests, while learning with each ask. The system integrates with Slack, email, and text.

5. FloQast

CATEGORY: Accounting

FloQast close-management software provides a single location for activities related to closing the books, with visibility for everyone working on the project. It claims to shorten closings by an average of three days by automating repetitive, time-consuming processes and integrating with both ERP systems and Excel. Among FloQast's hundreds of customers are Twilio, Nutanix, Zillow, and The Golden State Warriors.

6. RapidMiner

CATEGORY: Predictive analytics

RapidMiner's analytics platform for data science teams is well-positioned, given the exploding development of AI and machine learning applications. Gartner rates RapidMiner a best-in-class performer for its ease of use and its "wisdom of crowds" guidance for developing a predictive analytics process. The guidance is based on input from the platform's hundreds of thousands of users.

7. Nextiva

CATEGORY: Cloud-based VoIP

Nextiva's claim to fame used to be its affordable, user-friendly, enterprise phone system. A dozen years after its founding, Nextiva reportedly has 150,000 business customers. It has ratcheted up the stakes in 2018 with its new NextOS, which unifies fragmented enterprise communications technologies—phone, CRM, chat, surveys—as well as analytics into a single platform. The aim: souped-up customer sentiment analysis.

8. Acumatica

CATEGORY: Enterprise resource planning

With its cloud-based ERP system aimed at small and midsize businesses, Acumatica has a host of competitors. But none of them, arguably, is growing faster than Acumatica, which Nucleus Research recently ranked first in usability among all ERP platforms—including enterprise market leaders SAP and Oracle. Those two lead in functionality, but in usability Nucleus rates Acumatica ahead of notable competitors NetSuite, Epicor, and FinancialForce.

9. Paycor

CATEGORY: Payroll/HR

It takes guts to battle a dominant market player, but Paycor has been looking up at ADP since 1990 with its payroll and HR services for small and midsize companies. Things have changed along the way, with the once-tiny Paycor having sustained meteoric growth for a decade-plus and achieved annual revenue exceeding $200 million. Highlights of 2017 included new data visualization and learning management solutions.

10. Medallia

CATEGORY: Customer experience management

Customer experience initiatives are hot. Enter Medallia's cloud-based customer feedback management platform, which helps companies collect and analyze customer interactions from the web, social media, SMS, and other channels. The insights can be distributed across an organization in real time, and built-in workflows help employees close the loop with customers. The information can also be used to identify coaching opportunities and experiment with innovative ideas through A/B testing. CFO

Thinkstock

Thunder in the Cloud

Migration to the cloud is causing a buildup of cyber risks that could leave customers financially exposed. **By David M. Katz**

Insurers dread what they like to call "aggregation risk." The threat arises when a large number of companies face the same catastrophic peril concurrently, multiplying the potential losses in an insurer's portfolio. The issue gained prominence in the wake of the 9/11 attacks, when many companies in the same location lost people, saw property destroyed, and suffered lengthy business interruptions from a single event.

Flash forward nearly 17 years and the problem is cropping up again, but in a different form. This time, the aggregation refers to the vast accumulations of cyber risks faced by companies seeking efficiency and safety by automating some or all of their operations in the cloud. What could happen to such companies if one or more of the large providers that have cornered the cloud-computing market gets hit with a devastating cyber attack or suffers a system failure?

To be sure, nothing comparable to the loss of the more than 3,000 lives and $10 billion in property and infrastructure damage caused by the September 11 attacks has hit corporate America. But the aggregation of risk in the cloud creates an attractive target for hackers and a place where small mistakes, like a flub during a routine maintenance upgrade, can wreak widespread havoc.

A cyber incident that takes a top-three cloud-services vendor offline for three to six days would spawn customer financial losses of about $7 billion to $15 billion, according to a report, "Cloud Down," by Lloyd's of London and catastrophic risk modeler AIR Worldwide.

Rather than focusing on just the security of their own company networks, CFOs and risk managers must now consider the threat of existing in a much wider "attack surface" (as cyber-risk management experts call it), which multiplies the chances of being hit.

Cloud platforms have limited responsibility. For companies using infrastructure-as-a-service, the cloud provider is only responsible for core infrastructure security, like storage and networking at the physical level. Software-as-a-service providers, in contrast, are responsible for more, like application-level controls and, in part, identity and access management. However, customer data is never the cloud provider's province, which "in the event of a breach makes [the customer] most liable for any third-party damages or responsible for regulatory action," according to Lloyd's/AIR.

Cloud customers would like providers "to assume unlimited liability for outages and any resultant business interruption," says the Lloyd's/AIR Worldwide report.

And few, if any, cyber insurance products offer the kinds of payouts or the type of coverage companies will need if a massive cyber event in the cloud threatens their ability to function.

Fundamental Shift

The sources of potential losses assume a wider footprint as companies become more dependent on outside information-technology providers, who themselves are part of a closely intertwined tech supply chain. And the stunning speed with which this supply chain has arisen hasn't given corporations much time to erect cyber defenses or devise backup plans adequate to the risk.

In a 2015 report, McKinsey & Co. noted a "fundamental shift" by corporations from the traditional approach of maintaining computers and servers on-site to outsourcing those functions to cloud-services providers. Citing that shift, McKinsey predicted that the percentage of global companies using traditional IT infrastructure would drop from 77% that year to 43% by 2018. Over the same period, companies using the publicly available cloud for at least one IT task, the firm predicted,

Thinkstock

would jump to 37% from 25%, based on the survey of about 800 CIOs and other IT executives.

While McKinsey hasn't updated its numbers, it's obvious that many companies are putting the management of exceedingly costly cyber risks in the hands of third-party providers.

In the universe of tech companies servicing the publicly available cloud, in which users buy slices of server time in a multi-tenant environment, there are just five providers or so. As of February 2018, according to the RightScale State of the Cloud Report, 64% of 997 IT professionals surveyed said their companies were running applications on Amazon Web Services; 45% on Microsoft Azure; 18% on Google Cloud; 10% on IBM; and 6% on Oracle.

That market concentration increases the likelihood that a hacking attack or a major outage experienced by one or more of the top providers could hurt many among the burgeoning number of companies whose networks or applications are housed in the cloud. Cloud vendors tend to minimize corporate concerns about that. They argue that aggregation risk is really a concern of insurance companies likely to have a large number of at-risk clients in their portfolios, and not a systemic risk to cloud providers or their customers.

"Among insurers, there is widespread recognition of the potential for extreme accumulated losses from a cyber event, be it from an attack on a cloud provider or payment processor, a power grid attack, a massive data theft aggregation event, [a hacker] exploiting a weakness in a commonly used software application, or any one of a number of other nightmare scenarios," according to the Lloyd's/AIR report. But cloud providers seem to lack that recognition.

Better in the Cloud

Contrary to the claim that customers should be worried about security in the cloud, cloud-services vendors maintain that they offer customers a big step up in security compared with the days when businesses were managing their own cyber risks. Ann Johnson, a vice president in Microsoft's enterprise cybersecurity group, contends that businesses operating outside the cloud have a significant flaw: "their tools to protect, detect, and respond are not integrated."

Because of that, the amount of time between when such companies detect a cyber attack and when they recover from it, known as "attacker dwell time," is much too long, according to Johnson. "The cloud changes the entire approach to one that democratizes cybersecurity, giving experts and the resource-constrained the same powerful tools," she says.

Johnson notes that the $1 billion Microsoft spends yearly on cybersecurity includes investments in malware protection and threat intelligence centers aimed at guarding its customers. Azure, the company's cloud-computing service, provides protections for third-party cloud applications—demonstrating concern, perhaps, for the security of the broader IT supply chain it inhabits.

Indeed, there's no evidence that cloud providers are skimping on things like co-located hardware, redundant networking and power, and business continuity plans. But the big cloud infrastructure providers are not invulnerable to bugs, breakdowns, and human errors that can have broad-scale effects. Azure, Google Cloud, and AWS have all experienced major outages or disruptions in the last few years. Their length ranged from a couple of hours to three days. In February 2017, the AWS Simple Storage Service (S3), which provides hosting for images, entire websites, and app back ends, experienced a severe, four-hour disruption that affected some websites for up to 11 hours.

Small Steps

The fear of absorbing the costs of such interruptions has so far led services providers as well as underwriters to step gingerly into the business of indemnifying companies. According to the Lloyd's/AIR report, while cloud customers would like providers "to assume unlimited liability for outages and any resultant business interruption," vendors want to restrict and cap their liability.

Even if a major cloud provider bears some responsibility for a service outage, affected customers are very rarely compensated. The customer is more likely to receive credits for a certain amount of free usage. And where the legal burden lies is unclear. Determining which jurisdiction's laws apply during a particular downtime event of a cloud service would be considerably complex, says Lloyd's/AIR.

A Variety of Threats

The following hazards could lead to prolonged cloud service downtime.

Lightning strike on a data center
Flooding and earthquakes
Accidental cutting of fiber line to ISP
Intentional destruction of power grids
Distributed denial-of-service attack on cloud provider
Intentional deletion of a large number of virtual machines by a malicious insider
Human errors introduced during routine maintenance or upgrades
Accidental stoppage of a core cloud service, such as storage
Failure of environmental management systems

Source: Lloyd's/AIR Worldwide

While some companies might be able to individually negotiate indemnification provisions in their cloud-computing contracts, "the bulk of the costs will be on the insureds themselves," says Elissa Doroff, an underwriter and product manager for cyber liability at XL Catlin, a large commercial insurer. (Microsoft did not respond to a question about the kinds of indemnification or insurance, if any, it provides for its cloud clients.)

Not that insurers have been eager to pay for the bulk of those costs, either. Thus far, insurers have managed to hive themselves off from the vast magnitude of cyber perils, avoiding excessive exposure to ransomware attacks and data breaches experienced by their corporate policyholders.

So, while many U.S. companies buy insurance to cover cyber risks, the coverage under such policies is severely limited. Many cyber insurance policies include low limits on the dollars they will pay out after a loss, long waiting periods after a cyber event happens before coverage kicks in, and "a multitude of exclusions," according to the Lloyd's/AIR study.

For example, Equifax incurred $164 million in costs related to its large data breach in the summer of 2017, but only $50 million was offset by insurance. This year, Equifax is projecting about $200 million of net incremental IT and data security project costs and legal and professional fees, of which insurance is expected to cover $75 million.

The laser-like specificity with which insurers have zeroed out their exposure to serious cyber losses has resulted in a confusing array of highly specific "standalone" policies (referred to as such because they stand apart from the cyber coverage offered in traditional property-casualty policies). Standalone cyber insurance is typically triggered by claims stemming from either a security failure or unauthorized access to the policyholder's network.

Such policies may cover costs stemming from business interruption, cyber extortion, data loss, theft or fraud, regulatory fines, and lawsuits arising from a data breach, according to a 2017 report by the Risk and Insurance Management Society. The services the policies can pay for include forensic investigation, public relations, reputation and crisis management, breach notification, and restoration of proper credit monitoring for hacked clients.

Leery of losses, though, the insurance industry has acted to limit its exposure to the cloud. Indeed, the insurance industry today would foot the bill for only about 20% of the business effects of a major cloud vendor's three-to-six-day event.

While some policies may cover the income a company loses when its network goes down, they haven't typically been triggered when the downtime results from a problem experienced by a cloud-computing vendor or other third-party IT service provider. Now, however, insurers are hot to sell "contingent business interruption" coverage that reimburses a company for earnings lost when a vendor gets hit, players in the cyber insurance market say.

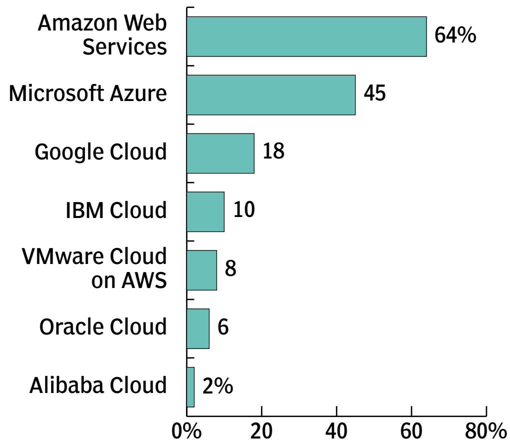
There is an opportunity for the insurance industry to help businesses prepare for and recover from extreme scenarios of cyber risk aggregation, says the Lloyd's/AIR report. But that's not a priority yet. Meanwhile, in the scenarios run by Lloyd's/AIR, smaller companies in particular fare badly, since they are more likely to use the cloud to avoid building computing infrastructure in-house. In addition, they rarely buy cyber insurance.

So, while movement to the cloud may "democratize" cyber security, it is definitely not distributing the risks evenly: in the event of a severe disruption to or an attack on a cloud services platform, the bulk of the financial losses could be borne by the businesses that can least afford it. CFO

David M. Katz is a freelance writer based in New York.

A Small Universe

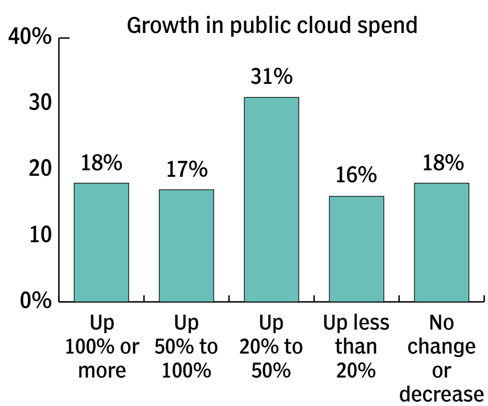
Amazon Web Services is used by a majority of enterprise IT professionals to run applications in a public cloud.



Source: RightScale survey of 997 IT professionals, 2018 State of the Cloud Report

Up, Up, and Away

Thirty-five percent of businesses plan to increase their spending on public cloud services in 2018 by 50% or more.



Source: RightScale survey of 997 IT professionals, 2018 State of the Cloud Report

Looking Up

Buoyed by the Tax Cuts and Jobs Act, U.S. CFOs project sizable increases in earnings, capital spending, and technology outlays this year. By Chris Schmidt

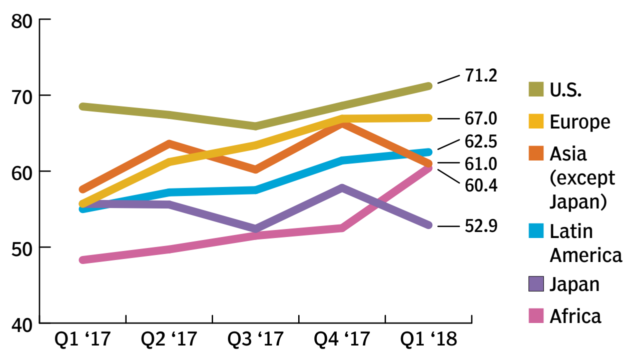
The Tax Cuts and Jobs Act may be getting a lukewarm reception from consumers, but CFOs are clearly over the moon about the lower corporate income tax rate and other provisions in the new law. In the first quarter, CFO optimism in the United States climbed to its highest level since 1996, and finance chiefs laid out their concrete plans for spending the tax cut windfall, which should be a shot in the arm for the U.S. economy.

According to the results of the latest Duke University/*CFO* Global Business Outlook survey, which ended March 2, more than 40% of U.S. companies plan to boost wages and 38% to increase hiring in 2018 because of the recent tax cuts. About 36% will increase domestic investment and 31% will increase cash holdings. And, among companies with defined benefit pension plans, 29% said they will boost pension contributions.

Sixty-six percent of U.S. CFOs said corporate tax cuts will help their companies over the next three years, with 36% saying the overall benefit will be medium or large. Only 14% rated the overall effect as negative. "Some benefits of tax reform are already being felt, while others will unfold over the next several years," said John Graham, a finance professor at Duke's Fuqua School of Business.

Economic Optimism Rises Outside Asia and Japan

Finance executives rate their optimism about their domestic or regional economy*



*On a scale of 0–100, with 0 being least optimistic

Among companies that plan to increase investment in the United States, 53% said the reduced corporate income tax rate was the reason. Forty-four percent indicated the immediate expensing of capital expenditures enacted under the new law was driving their change in U.S. investment plans. Full expensing of qualified capital expenditures lasts for only five years, however, and 37% of companies indicated they would shift investment so that it occurs sooner.

Due to tax reform, CFOs expected the effective (or average) tax rate for U.S. companies to fall by about 5 percentage points, to 18.8% from 24%. The lower U.S. tax rate increases the after-tax return on investments, so it's no surprise that about half of Canadian, Latin American, and Asian CFOs responding to the Duke/*CFO* survey said that the reduced rate makes the United States a more attractive place to do business.

Record-High Optimism

The CFO optimism index in the United States increased to 71.2 on a 100-point scale in the first quarter, an all-time high. Optimism among finance chiefs remains elevated around the world, anticipating strong global economic conditions this year.

"Our analysis of past results shows the CFO optimism index is an accurate predictor of future economic growth and hiring, therefore 2018 looks to be a very promising year," said Graham. However, "promising" doesn't mean without challenges.

With the United States at or near full employment, the proportion of firms indicating they were having difficulty hiring and retaining qualified employees remained at a two-decade high, with 45% of CFOs calling it a top concern during the past quarter, up from 43% in the last period of 2017. At the median, U.S. companies planned to increase employment by 3% in 2018.

The tight labor market also continues to put upward pressure on wages, with wage inflation now listed seventh among the concerns of U.S. CFOs. U.S. companies expect to pay higher wages, with median wage growth of about 3% over the next 12 months. Wage growth is projected to be strongest in the technology, energy, and service/consulting industries.

After difficulty finding the right employees, the next biggest concern among U.S. CFOs in the past quarter was the cost of employee benefits, which 33% of finance chiefs cited. Regulatory requirements, government policies, and data security rounded out the top five.

66%

U.S. finance executives who said tax cuts will help their companies over the next three years

Adopting Innovation

The first-quarter Duke/*CFO* survey asked a series of special questions about blockchain and cryptocurrencies. Blockchain is the distributed ledger technology widely expected to disrupt business models as it is adopted for verifying ownership and allowing secure and nearly instant transactions with low fees.

Seventy-eight percent of U.S. finance chiefs responding to the survey said they don't expect to be affected—or aren't sure how they'll be affected—by blockchain. Seventeen percent said their firms will be affected but haven't yet adapted their business model in response. Four percent said they are working to adopt blockchain, and just 1% said they have already adopted the technology. Only 3% of U.S. CFOs claimed to understand it.

"The U.S. needs to wake up in the fintech space," said Cam Harvey, a founding director of the survey, who teaches a blockchain innovation course at Duke's Fuqua School of Business. "China is doing nearly $10 trillion in mobile payments, while the U.S. is barely over $100 billion. Most of the big innovations over the past 25 years have originated in the U.S., but this time is different. There is a lot at stake and, right now, it looks like China will be eating our lunch."

Twenty-seven percent of survey respondents said they have already reduced their finance workforce or will within five years because of finance technology, or "fintech," advances. However, more than 70% of finance executives said they do not expect to cut finance employees because of fintech. "Finance back-office jobs are low-hanging fruit for the fintech disruption," Harvey said. "It's logical to expect that 70% of firms will cut finance employees, not the other way around."

In contrast to the United States, nearly 20% of European CFOs said they understand blockchain technology well, up from only 8% who said they did two years ago.

Global Bumps

Elsewhere around the world, economic optimism among CFOs in Canada dropped to 59 from 64 (on a scale of 0 to 100). Capital spending is expected to shrink and hiring will be flat in 2018, but earnings are expected to grow above 7%.

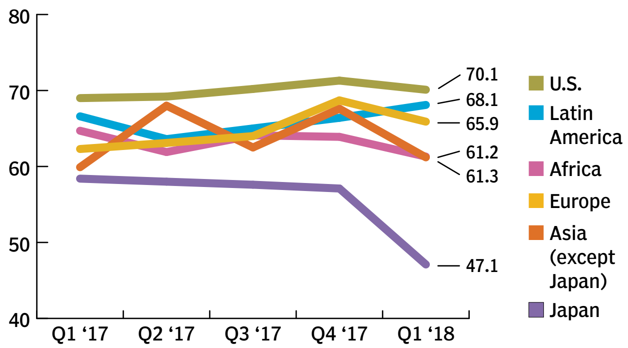
Optimism in Europe remains high at 67, although CFOs in the United Kingdom recorded an optimism level of only 60, thanks to ongoing distress over Britain's forthcoming exit from the European Union. CFOs across the pond estimated capital spending will grow about 5% in 2018, with employment growth flat.

Optimism in Asia (except Japan) fell to 61 from 66.3 last quarter. Economic uncertainty, access to capital, difficulty attracting qualified employees, low employee morale, and currency risk were top concerns in the region. Still, the Japanese economy remains on a prolonged expansion streak, the longest in 30 years. Capital spending was expected to grow about 10%, and employment 3%, in 2018.

In Latin America, CFO optimism about the domestic economy continued to rebound in most countries, rising to 70 in Mexico, 69 in Chile, and 62 in Brazil. Economic uncertainty was the top concern among CFOs in the region. Despite the positive trend of higher prices for key commodities, Latin American economies expanded less than expected at the end of 2017. While the region is expected to benefit from strong global growth in 2018, most governments in the region still face large budget deficits.

Company Confidence Declines In Most Regions

Finance executives rate their optimism about their own companies' financial prospects*



*On a scale of 0–100, with 0 being least optimistic

Source for all charts: Duke University/*CFO* Magazine Global Business Outlook Survey of finance and corporate executives. Responses for the current quarter include 263 from the U.S., 63 from Asia (outside of Japan), 16 from Japan, 106 from Europe, 86 from Latin America (including Mexico), and 47 from Africa.

Wikimedia Commons

The Revolution Will Be Digitized

Driven by intense competition and heightened customer expectations, CFOs are making a serious long-term commitment to digital transformation. By Josh Hyatt

Here, without question, is the most appealing, step-by-step path for those companies seeking to carry out a digital transformation: (1) shut down completely; (2) remake from scratch organizational structures and internal business processes; (3) re-emerge with new capabilities for engaging employees, customers, and investors.

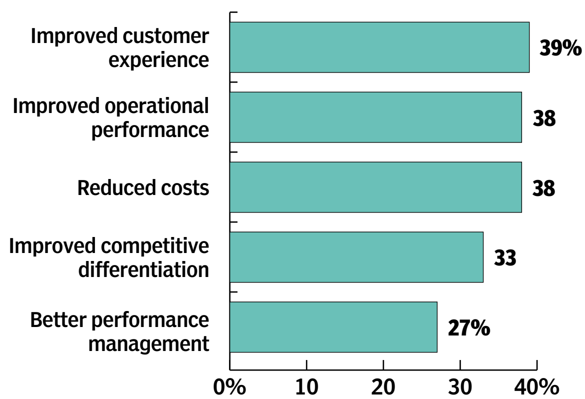
If only that were possible. The absence of any such option in the real world means that senior finance executives must keep their businesses running—taking orders, shipping products, posting revenue—while simultaneously reshaping core operating and business models. As daunting and draining a task as digital transformation can be under those circumstances, most senior finance executives say they are ready to tackle it.

That, at least, was the collective sentiment among respondents to an online survey, "2018 CFO Insights on New Technologies," conducted by CFO Research in collaboration with Grant Thornton. The survey drew 304 responses from senior members of the finance function, ranging from CFOs to directors of finance.

More than half of the surveyed executives worked for businesses with annual revenues of more than $100 million and up to $5 billion. One-quarter of surveyed executives were from companies with revenues between $1 billion and $5 billion. Respondents' industries varied widely. The largest segments of respondents were from financial services/insurance, auto/industrial/manufacturing, health care, and wholesale/retail trade.

FIGURE 1

Two years from now, which enterprise goals do you believe will most strongly influence your organization's strategy for investing in (or continuing to invest in) digital transformation?*



*Multiple responses allowed; top five responses shown

Taking the Longer View

More than two-thirds (69%) of survey participants said their company planned to increase its investment in digital transformation in the coming year. Four in 10 surveyed executives (39%) said that investment would increase by at least 10%. The majority of surveyed respondents (56%) reported that senior leadership at their organizations viewed digital transformation as critical to long-term business success.

Such a forward-looking mindset contrasts sharply with recent years, when short-term digitization initiatives spread from function to function, sequentially remaking areas such as customer service, human resources, and sales support. Companies are now committing themselves to pursuing broader-based, long-term transformations. The reason?

Among finance executives, at least, there is a distinct understanding of how imperative it is for companies to keep a competitive edge. Among the executives planning increases in digital investment, 41% said they are seeking to differentiate themselves from the competition, while 52% are striving to just stay even. But the enterprise goal that finance executives believe will most strongly influence their organizations' investment in digital strategy going forward is improving the customer experience. (See Figure 1.)

The surveyed executives, it seems clear, are acutely aware of how dramatically digitization can drive value, enabling their companies to create much richer customer experiences. When asked to share the one problem that they most wish technology could solve, executives' answers most often pertained to serving customers. One surveyed executive wished for "simplifying the customer experience." Another desired "a set of predictive analytics that guide us to anticipate our customers' needs so that we can be even more proactive, particularly in marketing and sales."

As customers have become increasingly digital-centric, satisfying their heightened demands has turned into a competitive necessity. By leveraging data-intensive processes and platforms, companies can acquire the nimbleness they need to keep designing and delivering more responsive and personalized customer experiences. Exploiting the full force of digital technology, by applying advanced analytics to segment and serve customers, can build momentum and drive growth. By consistently revisiting strategies for giving customers a dynamic cross-channel experience, companies can elevate customer satisfaction and forge long-term relationships.

69%

Finance executives who said their companies planned to increase investments in digital transformation this coming year

Shedding Fear of Commitment

Digital transformation is more than an investment, it's a commitment—and a two-pronged one at that. Not only is technology always advancing, but the challenges of managing an organization through such a vital transformation are continually surfacing. Broadly, companies may have to reorganize by combining individual silos or by reversing an ingrained tendency toward decentralization. While a successful digital transformation is enabled by technology, it ultimately requires changes in the habits and structures of an earlier analog era.

No matter the organizational structure, the breadth of the need for digitization is bound to exceed available resources. The IT function, after all, is under pressure to address a host of challenges that accompany growth (see Figure 2).

Therefore, once companies identify opportunities, they need to prioritize them, balancing back-office functions with customer-facing activities. The goal is to keep both ends as aligned as possible, ensuring that the entire customer experience progresses at as even a pace as possible.

The company that emerges from such a transformation will be much more data-driven, agile, and capable of adapting to new ways of working. Built on a foundation of reliable and scalable services, such as cloud technology, a company's infrastructure isn't so much created as it is assembled, a function of leveraging and blending available platforms.

In the survey, executives expressed concerns regarding both the fundamentals of managing increased volumes of data—"aggregating and making sense of big data," as one respondent put it—and the deeper challenges involved in ensuring that the data is useful.

One executive alluded to the scope of transformational technology by elaborating on the challenge of "improving the overall quality and consistency of data across the business segments around the globe." Added the respondent, "The explanation of why this is critical has not been effectively communicated, and the potential impact across the business is not yet understood."

Making such issues understood throughout the business is also part of digital transformation, which changes more than just the nature of the company's products and services. To compete in a dynamic business environment, companies need to define and keep *redefining* the set of digital experiences they want to deliver. Rather than a top-down change that a company must implement periodically, digital transformation requires an ongoing adaptability that becomes part of a company's mindset.

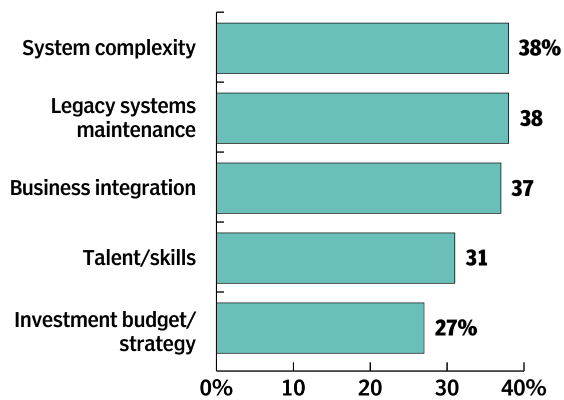
Digital Receptivity

Instilling digital know-how into an organization means ensuring that employees understand the vision and possess the necessary capabilities to bring it to fruition. For some companies, achieving that end requires recruiting employees who already possess the needed skills or hiring executives who can coach current workers in the desired direction.

To enable digitization on a transformative scale, organizations must keep internal communication lines open, as cross-functional groups create shared criteria for success and agree on milestones. A digital transformation, after all, is the outcome of many mini-transformations, carefully coordinated and strategically aligned. Rather than being constrained by a hierarchy or hampered by rigidity, organizations must be imbued with a collaborative culture of continuous improvement. CFO

FIGURE 2

What are the greatest challenges your IT organization faces as it seeks to support enterprise growth?*



*Multiple responses allowed; top five responses shown

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Hire Learning

In the wake of the U.S. corporate tax cuts, about one-third of companies plan to increase domestic hiring. But with workers getting scarce, the fight for talent will dominate 2018. Companies will be pushed to use the latest tools to screen, test, and evaluate talent. How much do you know about job search and hiring trends?

1 In 2018, what percentage of Americans will be looking for a new job, according to Glassdoor?
- A. 52%
- B. 14%
- C. 26%
- D. 38%

2 A large majority of workers leave their job for which reason, according to numerous global studies?
- A. Insufficient compensation
- B. Poor overall company performance
- C. Distrust/dislike of management
- D. Lack of appreciation for their work

3 At what time and on which day of the week do job searches on the Internet and on job sites peak?
- A. Friday, after 3 p.m.
- B. Monday, before 11 a.m.
- C. Thursday, after 5 p.m.
- D. Wednesday, after 12 p.m.

4 Which employee benefit do job candidates want most from a hiring company?
- A. Profit sharing
- B. Retirement plan
- C. Health insurance
- D. Flex time

5 Which interviewing innovation do talent professionals think will prove most useful to companies that are trying to get better at hiring?
- A. Soft skills assessments
- B. Job auditions
- C. Meeting in casual settings
- D. Video interviews

6 The use of data is one of the top trends impacting how organizations hire. Which is NOT one of the top uses for data in talent acquisition?
- A. Predicting candidate success
- B. Assessing soft skills
- C. Evaluating skills gaps
- D. Predicting talent supply and demand

7 Where will artificial intelligence prove most useful in the hiring process, according to talent professionals and hiring managers?
- A. Sourcing candidates
- B. Screening candidates
- C. Scheduling candidates
- D. Responding to candidates' questions

Answers: 1–D; 2–D; 3–B; 4–C; 5–A; 6–B; 7–A

Source: LinkedIn, Glassdoor, Careerbuilder, Gallup | Photo: Thinkstock