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**Digital transformation** and a renewed emphasis on **customer experience** have CIOs seeking a more agile approach to delivering IT services.

# *Delivering* IT as a **PRODUCT**

BY ESTHER SHEIN

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# Delivering IT as a product

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BY ESTHER SHEIN

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# Who's succeeding with product-focused IT?

**Many CIOs are facing the most challenging undertaking of their careers: shifting their IT organization's focus from projects to products.**

BY MARTHA ROUNDS

**O**rganizations are making the shift to delivering IT as a product — a multistep process, rife with challenges. First, there's the need to lay the groundwork for change, and to extend a product mindset across the organization. Then governance must be implemented, product teams must be structured and imple-



mented, and supporting IT capabilities must be created. Unlike leaders of startups, who can create an organizational vision from scratch, CIOs have to create their “new-not-new” IT organizations within the existing business mission and vision, supporting ongoing initiatives while laying the groundwork for transformation.

There’s no roadmap for success, but some companies are successfully pulling it off. Here’s how three IT organizations have risen to the challenge.

### Forming product groups

As part of its move toward agile development, a \$4.4 billion U.S. manufacturer now has five product groups focused on workforce, innovation, customers, manufacturing and analytics. Each group has a product manager who works directly with a business leader to determine what business capabilities that function needs IT to deliver.

## CIOs have to create their “new-not-new” IT organizations within the existing business mission and vision, supporting ongoing initiatives while **laying the groundwork for transformation.**

For example, human resources and employees’ digital experience both come under IT’s workforce product group. “It’s up to the leader of the workforce group to understand the capabilities this part of the business needs and to dig into the details and put together a program and roadmap — and then to drive that roadmap,” explains the company’s CIO. IT then uses metrics to track progress and measure success after each capability is developed. “This marks a radical departure from previous IT-business conversations,” the CIO says.

### Creating cross-functional teams

The IT organization for an \$8 billion U.S.-based financial services organization has cross-functional teams that deliver capabilities to enhance various value streams. Capabilities — which ultimately can be integrated as APIs into larger customer ecosystems — continually evolve according to customer needs and market opportunities. Each capability is considered a product, which is overseen by a product manager. It took only four months for a cross-functional team working in the company’s

business accelerator program to deliver a new capability that has significantly improved how 10,000 employees interact with customers who use bank branch locations. The same capability would have taken 18 months to deliver under the previous system, in which business analysts delivered requirements to application developers who used a waterfall method with separate infrastructure and security teams. In addition, when the capability was delivered, the project would be closed.

Now, in contrast, IT focuses on evolving capabilities as business needs change. To ensure continuity in the ongoing development and delivery of new or expanded capabilities, the company has created the role of product manager, whose job responsibilities are much the same as the product manager at a software company. And IT has set speed and the level of new capabilities delivered as two of its key success metrics.



## Changing IT and business culture

The CIO of a \$6 billion manufacturing company has found that shifting from a project to a product orientation requires a huge cultural change for both IT and business. IT professionals must have a closer relationship with the business and a deeper understanding of customers. In turn, business must embrace IT as a

ket needs, make customers aware of a product, and know how we should support our products,” the CIO notes. “They look out across months and years and oversee consistent product management and product delivery. It’s that broad and timeless.”

The company also deploys project managers on both IT and non-IT projects. In fact, the CIO has taken on responsibility for all

**“The skill set of project managers is invaluable in the old world and the new world.”**

full-fledged business partner. To achieve these two objectives, the CIO dedicates IT staff to specific business functions at the company.

Product managers at the company function much like product managers at a commercial software company. “They assess mar-

project management at the company, creating a project management center of excellence within IT. “The skill set of project managers is invaluable in the old world and the new world,” the CIO says. ♦

Martha Rounds is research director for IDC’s IT Executive Programs.

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# How AI is reshaping IT operations

**IT organizations are adopting AI-based tools to improve support, optimize infrastructure, and predict system breakdowns, freeing up staff for higher-value tasks.**

BY MARIA KOROLOV

**A**rtificial intelligence is eating the world, one bite at a time, and IT operations is no exception. Still early in deployment, companies are taking advantage of AI and machine learning to improve

tech support and manage infrastructure. Here, natural language processing is a valuable IT tool. The technology, which fuels most customer service chatbots, is being put to use in internal IT operations to improve tech support and UIs. Credit Suisse Group, for

example, rolled out a chatbot last December to help process routine requests such as password resets and computer reboots.

“We were primarily a voice-only support center, which didn’t enable us to have efficiencies in terms of how we handled our

users’ queries,” says Jennifer Hewit, the company’s head of cognitive and digital services.

Credit Suisse chose the Amelia chatbot system from IPsoft in early 2017, and had it up and running by year’s end. The new system serves 76,000 users in 40 countries and

has allowed Credit Suisse to move some of its 80 tech support agents to higher-level support. “My ambition is by the end of the year to have automated 25 percent of the queries coming into the service desk,” Hewit says.

With the ultimate goal of freeing up one-third of the company’s tech support staff, Credit Suisse’s use of AI in IT underscores the impetus fueling the trend: to empower IT personnel to drive business value by handing over low-level work to machines better suited to the task.

### Using AI to secure and inspire

Texas A&M University System has deployed Artemis, an intelligent assistant from Endgame, to help new staffers keep the university secure from cyberattacks.

“We monitor the networks for 11 universities and 7 state agencies,” says Barbara Gallaway, security analyst at Texas A&M University System. Gallaway’s team includes

nine full-time staff and eight part-time student workers who don’t have the experience required to deal with security incidents.

The AI system enables her staff to ask questions in plain English, helping to train them in their jobs as a side benefit. “We just did a new round of hires in January, and it literally took them two hours to figure out what they were doing and jump in and do their job,” she says. “They learned at a quicker pace, and we had fewer people coming to our full-time people asking questions.”

It also has had a positive effect on recruitment. Two years ago, when hiring three security analysts, the team couldn’t find enough applicants for the jobs.

“This January, we had 88 applicants for seven openings,” Gallaway says. “The word of mouth was that what we were doing was fun.”

### Managing infrastructure

Murphy Oil has been moving its infrastructure to the cloud for the

“My **ambition** is by the end of the year to have **automated 25 percent** of the queries coming into the service desk.”

– **JENNIFER HEWIT**, HEAD OF COGNITIVE AND DIGITAL SERVICES, CREDIT SUISSE GROUP

past year, but the biggest savings have been from adding intelligence to the management of its cloud infrastructure, says Mike Orr, IT director of digital transformation at the company.

“If you just lift and shift your workload to the cloud, you’re not going to save any money,” he says. “It might even cost you more.”

The cloud does allow for flexibility, but it can take a lot of people

to adjust the workloads, and that adds up. The company turned to an AI-powered system from Turbonomic to make infrastructure optimization recommendations. The real payoff came once Murphy Oil grew comfortable enough to trust the system to perform placement and sizing automatically.

“There’s another setting that said, ‘Based on these learnings, we’ll take these actions. Are you okay with that?’ Once we turned that on, we found that the software made a better decision than my people did,” says Orr. “It let the data drive the decisions rather than gut and emotion.”

Prior to the move, Orr had four and a half full-time equivalents working on nothing but tickets. “Now it’s one-tenth of [a full-time employee],” he says.

That enabled Murphy Oil to move staff from basic operations and maintenance to business enablement. One employee, for example, is now learning about



automating processes so that the company can move further up the maturity curve.

### Predictive maintenance

Netherlands-based Interxion is another organization using machine learning to improve operations and drive savings. The company, which operates 50 data centers in 13 cities around the world, began deploying Schneider Electric's EcoStruxure data center infrastructure management (DCIM) technology a few years back.

"We are building, typically, four new data centers a year," says Lex Coors, the company's chief data center technology and engineering officer. "That gives us the opportunity to look back and see how the old ones are doing without any EcoStruxure, what are the ones doing with the early version of EcoStruxure, and the latest version."

Early versions were difficult to use, he says. They provided plenty of information, but more staffers

were needed to make sense of the data and to make decisions and implement them.

The latest iteration of the product includes more intelligence, and now the savings are coming through, he says. The replacement capital expenses budget had savings of between 1 and 2 percent, he says. "In the maintenance opex budget, I'm looking at a 10 percent decrease with the full benefit of all the analytics."

That's because the company can do the right maintenance, at the right time, to avoid equipment breakdowns, he says, adding that

there are also recommendations for optimizing energy efficiency.

But even the latest versions need work. "The machine learning capabilities of our DCIM systems are still limited," he says. "If I look at our data centers today and think about what we can do with machine learning, there is not yet much."

"This is a whole new area, a new development for the industry, and it's powerful," says Rhonda Ascierio, research director for data centers and critical infrastructure at 451 Research. "I think it's the beginning of a long-term evolutionary change towards inte-

With the ultimate goal of freeing up one-third of the company's tech support staff, Credit Suisse's use of AI in IT underscores the impetus fueling the trend: **to empower IT personnel to drive business value by handing over low-level work to machines better suited to the task.**

grating physical data center management with many other services. As the technology evolves, other data and services are likely to be added, including integrated workload management, energy management, staff services, and security and network management."

### It's all about point solutions

But a general-purpose AI-powered platform for IT operations remains elusive, says Michele Goetz, an analyst at Forrester Research.

"There are still no AI systems that really could replace a database administrator or systems admin-



istrator,” she says. “We still have a few years for these AI solutions to mature, and we also need time for enterprise organizations to have a better vision for what implementing AI in their IT environment should look like.”

One challenge is that AI needs large volumes of training data, and that is available only for particular types of problems. In addition, systems need to be able to talk to each other better than they do today, says Shannon Kalvar, an analyst at IDC.

“Technically, if we were to see the convergence of IT service management and IT operations management, we can do it in two to three years,” he says. “The technical hooks exist. But to be honest, I’m not seeing a lot of that kind of design thinking.”

According to a Turbonomics survey of 750 IT operations managers, conducted with Red Hat and AppDynamics, 68 percent said they are not yet leveraging AI

“I would argue that **this is the space a lot of people want to play in**, but I’m not sure any of us are there yet.”

– **SHANNON KALVAR**,  
ANALYST, IDC

for IT management, while 24 percent said they’re experimenting with it.

However, 84 percent said they believe AI could reduce complexity by creating self-organizing systems.

“I would argue that this is the space a lot of people want to play in, but I’m not sure any of us are there yet,” says Kalvar. ♦

Maria Korolov is a regular contributor to CIO.

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# RETHINKING IT SERVICE DELIVERY

**Digital transformation** and a renewed emphasis on **customer experience** have CIOs seeking a more agile approach to delivering IT services.

**Enter IT as a product.**

BY ESTHER SHEIN



## CarMax has been a driving force in the used car industry, but when it came to speed in innovation, its IT group needed more horsepower.

Delivering a good customer experience while remaining a market leader was foremost on the mind of Senior Vice President and CIO Shamim Mohammad. About three years ago, as the company was in the throes of defining its multiyear business strategy, Mohammad wanted to apply the brakes on how IT was operating and take a more tactical approach.

“We decided we had to change to innovate faster and change how teams work and change our focus,” he says. “At the end of the day, we want to be where customers are and provide them the option in terms of where, when and how they want to transact with us. In order to do that, we felt we had to make a substantial change in how we operate, [since] the traditional way wouldn’t work in the new world,” which was rapidly becom-

ing more digitized.

Today, the nation’s largest used car dealer delivers “IT as a product,” meaning teams that are delivering capabilities and experiences to its customers and employees “at a speed that they expect,” he says. The company has shifted the conversation about tech products that customers want and need and love to include how to go about delivering them quickly and iteratively, Mohammad says.

“This was a pretty significant shift in how we worked and operated,” he notes, “and rather than taking baby steps, we decided to shock the system. In other words, we’re just going to go all in.”

Because business strategy at CarMax is synonymous with IT strategy and vice versa, that became the foundation for shocking the system, Mohammad says. “No longer

“At the end of the day, *we want to be where customers are* and provide them the option in terms of where, when and how they want to transact with us.”

— SHAMIM MOHAMMAD, SENIOR VICE PRESIDENT AND CIO, CARMAX

was it something I’m trying to push as CIO; it was an organizational, enterprise-wide initiative.”

### WHAT IT AS A PRODUCT REALLY MEANS

● T as a product is a strategy companies are more frequently adopting to apply modern product management techniques for managing and operating an IT department. Typically, it involves the use of agile techniques as well as continuous integration and DevOps, to sup-

port a faster, more iterative way of developing digital systems, says Matthew Mead, chief technology officer of digital transformation consultancy SPR.

“This automatically shifts the relationship from IT being an afterthought in operations to IT being a partner in the planning and implementation process,” Mead says. “It can result in IT no longer being a cost center but rather viewed as a partner in driving efficiency gains, creating higher engagement, retaining



*“Each product will have clear business and IT ownership and a clear set of metrics managed by these owners, including security, quality, delivery, cost and value created.”*

— GANESH JAYARAM, VICE PRESIDENT OF IT, JOHN DEERE

customers, increasing revenue and implementing new revenue streams.”

Migrating to an IT-as-a-product strategy is a key component of the overall agile transformation that “started in earnest” this year at John Deere, says Ganesh Jayaram, vice president of IT.

However, the transition started a few years ago, Jayaram says, with early adopters who showed the rest of IT that “taking this approach creates clear accountability for highly autonomous product teams to drive quality and delivery improvements, while improving the level to which our IT products meet the needs of our business.”

He defines the concept as a collection of applications — or a single application — that enables an overall business capability or value stream.

“Each product will have clear business and IT ownership and a clear set of metrics managed by these owners, including security, quality, delivery, cost and value created. Each product will also have a multiyear roadmap with associated investment,” Jayaram says. That is in contrast to the company’s traditional approach to planning application development on a project basis based on annual budget constraints without the context of a longer-term roadmap.

Additionally, John Deere’s IT products offer clearly defined business value and a holistic estimate of IT cost, including development, support, infrastructure and any supporting shared service costs, he says.

### SELLING IT AS A PRODUCT

**C**onvincing others in the C-suite that change was needed meant having a lot of dialogue with his colleagues, Mohammad says. “At CarMax, we always have been fairly innovative and ... fortunately, we have a fairly informal and collaborative executive team,” he says. The timing was also right since

the company had just hired a new CMO “who happened to be very fluent with data and technology.” CarMax also brought on board a new chief operating officer.

It helped that Mohammad is also a CPA and has an MBA in marketing. For his entire career, he says, he’s been “a very, very focused IT business executive, so that combination really helped.” He says there were synergies among the three of them.

“We were aligned, and we got the rest of the team aligned,” he says.

But getting the rest of the leadership team to understand why the top used car company in the country had to change its approach to



delivering systems was another story. It was no small task, he adds.

Mohammad says his message was pretty simple: “If we don’t disrupt ourselves, someone else will. And disruption is really going to come from the technology and how we enable technology to drive the [customer] experience.”

Moving to IT as a product has been a gradual approach at Aflac, with IT providing the tech enablement while the business sets the strategy and direction, says CIO Julia Davis. It started about three years ago, when Davis was asked to do a proof of concept to get the business on board for the company’s [One Day Pay initiative](#).

“We were asked not to follow the traditional waterfall approach, and the CEO asked me what it would take, and I said, ‘We’ll do this in smaller chunks with 100 percent dedicated business and IT resources — and not 20 priori-

ties,’” she recalls. That was the first agile implementation, and Davis says it proved to the CEO that the new approach works.

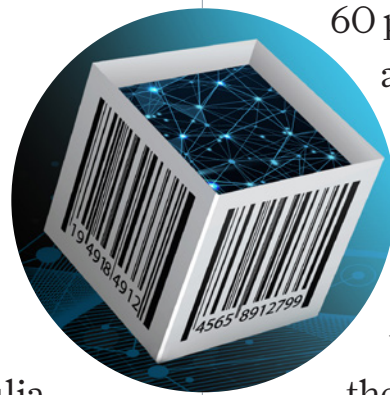
“He became our biggest advocate and champion,” she says. Unlike CarMax’s all-in approach, Davis estimates Aflac is doing about

60 percent of its work using agile processes. That will soon change, though.

Davis says it’s not effective to merely dab your toes in the water, and they will be all-in agile in the next few months.

“You’ve got to get the one win, and our one win was the One Day Pay initiative,” she says. “I had the opportunity to show this works, and I got more money for IT than ever before to focus on a tech roadmap. So building on that success made [the business] realize IT can deliver and we can get engaged in the process.”

To adapt to an IT-as-a-product strategy, IT needs to be open to



# 4 TENETS FOR MANAGING IT AS A PRODUCT

**T**HE PROLIFERATION OF CONSUMER TECHNOLOGIES is shifting the way CIOs are delivering technology services to their businesses. Nowhere is this more evident than at Walmart Stores, where CIO Clay Johnson is delivering IT as products rather than as projects or systems. Walmart’s culture change underscores how traditional companies are following in the footsteps of companies such as Facebook, Uber and others whose products are designed for the consumer masses.

“If you look at how [technology] products are developed, why wouldn’t IT teams have that kind of model?” says Johnson, who also serves as the retail giant’s executive vice president for global business services.

Among the first shifts Johnson made was to implement Workday human capital management software.

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adopting new tools and agile techniques to achieve their goals, says SPR's Mead. Agile strategies also have a way of creating transparency across the team, he adds. At the same time, "these changes can make some people uncomfortable, so expect some IT personnel to leave the organization and avoid this change. Culturally, once the team has a few months under their belts, there should be a feeling of camaraderie between teammates as their end goals are aligned, and there should no longer be an 'us versus them' feeling between IT and the business."

## IT'S ALL ABOUT THE TEAMS

To begin the process of removing walls to create a partnership between IT and the business, CarMax leaders literally took down the walls. Then Mohammad and his counterparts formed small, highly cross-functional teams of seven to nine people.

"When you walk into the workspaces, you can't tell who is who," he observes. "Teams are collocated, and they work for CarMax; that's the differentiation." He acknowledges that it took time for a lot of people to adjust to the change.

At John Deere, the process is similar in that IT and business partners are collaborating daily, making decisions faster and actively managing product priorities, says Jayaram. "The agile teams are more empowered than in the past, taking on decision making that was traditionally done by a supervisor. In addition, our business partners are fully engaged in the development process, jointly responsible for the entire lifecycle of the product, including the reduction of the products' ongoing support costs."

Since other parts of its technology organization [adopted agile processes](#), Jayaram says, the CEO and other senior executives already understood what deliver-

(CONT.)



Whereas IT managers would have previously been split into different groups, Johnson put one person in charge and collocated IT and business personnel responsible for deploying the product. The move inspired confidence among business executives and users. As a result, process design changes happened quicker, shrinking release cycles from 9 months to 3 months. "We saw the speed pick up and a lot more clarity in the process design and how it was going to be implemented," Johnson says.

Analytics derived from internet of things (IoT) data is among the big initiatives Johnson is focusing on this year. In 2017, Walmart deployed sensors in refrigerators and other areas across its 5,000 U.S. stores. The early use case is preventative maintenance to thwart food spoilage, with sensors tipping off the company to temperature changes in the coolers.

Future use cases could include sensors that trigger HVAC systems to regulate temperatures based on the number of people in stores. IoT might also note how people's shopping patterns can be used to improve logistics processes, such as better managing supply and demand.

As Johnson works through these and future technology services, he says the product management approach will take center stage. Johnson offered the

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## Change is scary for any group, but IT values working in a collaborative team environment.

— JULIA DAVIS, CIO, AFLAC

ing IT as a product meant.

“Their key concern was that this shift to agile not cause either a huge drop in productivity during the change or cause a bubble-up in cost,” says Jayaram. “We mitigated this issue by staggering the rollout over two years, so only a few teams are making the change during the same month. There have not been any real concerns on the other modernization initiatives like cloud or lean service management.”

Change is scary for any group, says Aflac’s Davis, but IT values working in a collaborative team environment. The organization has seen huge productivity increases in terms of throughput, capacity and quality using a test-driven approach, she says. “So quality’s gone up along with customer satisfaction, because the business now feels it is more engaged in the process and has a true understanding of what the limitations are and what the capacity is. You can’t have 5,000 things being done at once.”

### GAUGING PRODUCT SUCCESS

Often, IT measures project success by how many systems it delivers. At CarMax, “we changed the conversation to business outcomes,” says Mohammad. Teams have objectives and specific goals they must meet that are “business outcome-driven goals, not just output.” An outcome could be

(CONT.)



following four tenets that underpin the IT culture change he is initiating at Walmart.

**TRANSPARENCY.** Being upfront about what you’re trying to accomplish and offering clear, concise direction and feedback.

**OPEN CULTURE.** If you’re going to disagree, air it out in the room. For example, speed is everything in a DevOps lifecycle. Resolve disagreements in meetings and move on. “You can’t have a conversation and leave the room and nobody agrees or people change direction,” Johnson says. “You have to have the debate there and move on.”

**FAIL FAST.** Failure will happen so get over it – quickly. “When you do rapid iteration, you’re going to fail a few times,” Johnson says. “You have to get the business comfortable with it, too, and help them understand that there are going to be some things that might break or might not work but at the end we’re going to be in a lot better place and we’re going to get there a lot quicker.”

**OPEN DEBATE.** Everybody has a voice and can speak up, Johnson says. “You want to be able to hear everybody’s ideas when you’re driving an end-to-end ownership model.”

– Clint Boulton is a senior writer for CIO



a percentage increase in website traffic or in revenue, and the goals are measured every two weeks, so officials can see how the teams are tracking to those goals.

“Teams are encouraged to try different things to figure out how to achieve those goals,” he says. “We empower them and encourage them to try and fail.” Teams are also required to explain what they’ve learned — and what they’re going to do differently.

At John Deere, IT is running agile projects in eight-week cycles with four two-week sprints, says Jayaram. “We work to get the first product out to customers in eight weeks and then build up the features in each cycle. In addition, many of our agile teams demonstrate their work to the business partners every two weeks in sprint demos to ensure the solution will meet their needs.”

For example, IT recently worked to innovate the process of generating customer leads for dealers. Officials built an algorithm first in a



standalone, executable model with static data and gave the minimum viable product (MVP) to a couple of dealers to try, Jayaram says.

“This was literally deployed as an email attachment and was built in a single eight-week cycle,” he says. “The standalone system had to be manually updated every week and was very labor-intensive.”

## CONTINUOUS IMPROVEMENT

They then validated with the two dealers that the leads were useful and gained insight into what would make the system better. From that MVP, IT built a minimal online system that is now being deployed to a larger set of dealers in one region.

“This iterative approach is new for us; in the past, we would have justified and built out the whole system. It would have likely taken 50 percent longer and had a lower initial acceptance with the dealers,” Jayaram says.



*“This iterative approach is new for us; in the past, we would have justified and built out the whole system.”* — GANESH JAYARAM, VP OF IT, JOHN DEERE

Their initial measurement tactic is having the teams self-assess their maturity related to agile, cloud, security, UX and lean, Jayaram says. The teams then set one-year goals for where they want to improve.

“This allows us to tailor a team-by-team plan for what they need to work on. We are also setting organization-level metrics around each sphere (agile, cloud, security, UX and lean). For instance, we are working to get 40 percent of the teams at a base level of agile in year one and [over] 80 percent at a base level by year two.”

He uses the self-assessments to gauge where the teams are. “The most important thing is we get the teams in a mode of assessing where they are and setting self-improvement plans. This culture of continuous improvement will allow us to continue to streamline our organization.”

## MEASURING OUTCOMES

**W**ith the shift to agile at Aflac, Davis says the company has seen a twelfold increase from what IT was producing in 2014 to what the organization produced in 2016, “and we’ve been holding steady since then.” Davis has also decreased staff by 10 percent in the process, through a combination of full-time equivalent employees and contractors.

Another metric the IT organization has measured is emergency or unscheduled releases, meaning how often something in production has to be fixed. It was at 14 percent in 2014 and saw that rate decline to 3 percent by 2016, she says. Customer satisfaction was the third metric, which Davis says was at

40 percent between 2013 and 2016 and has increased to 79 percent.

When a merchandising product team at CarMax rolled out new, 360-degree-view digital cameras to almost 200 stores so that pictures can be taken of each car’s interior for the company website, the goal was to provide customers with close to a live experience of a car from their mobile device, Mohammad says. The deployment took two weeks and changed the customer experience and organizational processes in stores, he says, something that would not have been doable in a traditional IT environment. It went “fairly smoothly” because the mantra at CarMax is test and learn — and learn fast. We’re not saying, ‘Go deploy this thing after working on it for a year and see

what happens.’ We’re testing all the time so we’re failing all the time, quite frankly.”

The teams are told what to do and the goals they need to achieve, Mohammad says. “We don’t tell them how. In order to do the ‘how,’ they have to test and learn and come up with ideas.”

Measuring success in an agile world should include retrospectives for each sprint, says SPR’s Mead. Business and IT teams should meet and discuss what went well, what didn’t go well and what they can do next. “Success can be measured simply by the level of cooperation and transparency in the retro meetings,” he says, “and whether the joint team is meeting their goals in terms of software and product development.” ♦

Esther Shein is a regular contributor to CIO.



# Measuring value in the digital age

**How changing your mindset can help you make better technology investment decisions.**

BY KHALID KARK

**In Deloitte's recent** global CIO survey, only 21 percent of CIOs reported having a structured process for measuring the value of tech investments. Even more surprising, 14 percent said they don't measure the impact of technology investments at all.

Survey respondents cited two primary reasons for the low numbers. First, they may have a business

case process, but it's usually ad hoc and operates by the "squeaky wheel gets the grease" principle. Moreover, there is no mechanism to track the performance and value of investments. Second, some fear that adding governance to the investment process will slow down innovation and increase time to market.

During the past decade, CIOs have commonly taken on initia-

tives that require large, multiyear investments in platforms such as ERP and CRM systems; today, many are taking on significant digital transformations. Business leaders often go into these initiatives believing technology will solve their problem, but too often, these projects fail to deliver the promised value.

A different take on tech invest-

ments can help CIOs change how investments are viewed. Here are three shifts in mindset that can help CIOs make more effective investment decisions.

## **From expense to investment**

The majority of IT budget (55 percent) is spent on keeping day-to-day business operations running,



with 26 percent allocated to incremental business change, according to survey respondents. CIOs with an expense mindset often feel they have no control over the fixed costs of business operations and little control over incremental change spending, since those projects have already been committed.

By contrast, CIOs with an investment mindset constantly evaluate the value technology investments deliver. This value may decrease over time, or the cost of ongoing operations may no longer justify the benefits. Or estimated benefits may have been miscalculated, never to be realized. Evaluating IT budgets with an investment mindset often requires difficult judgments and decisions about projects. This may mean admitting to previous mistakes, but such analysis and decisions can help elevate CIOs to the role of business leader.

A CIO at a consumer packaged goods company took the bold step of halting a multiyear, multimil-

## Only **21%** of CIOs report they have a **structured process for measuring the value** of tech investments.

lion-dollar ERP implementation because the promised benefits were not being realized. By reallocating these funds to upgrade back-end systems — including an inventory management system that allowed the company to gain a competitive advantage and increase market share — the CIO delivered significantly more value.

### **From project to product**

CFOs often complain they are not able to determine tech ROI. This is partly because IT investments have always been viewed as projects, not products. A project mindset focuses on a discrete start and end date and a specific cost. The problem? These IT projects often span years and the investment reaches millions of dollars. Over time, business needs and competitive land-

scapes evolve. The company may change dramatically through M&A and divestitures. Or the original reasons for launching the project may no longer be valid. Yet many CIOs find themselves trapped into delivering these projects on time and under budget — even if the project is no longer needed.

A product mindset, by contrast, assumes that products will evolve to stay relevant and deliver ongoing value. The focus moves from project completion to product success. This perspective shifts the burden of success to the product team, which often consists of business and technology stakeholders. It can force collaboration and encourage a lifecycle perspective on the features, functionality, investments and benefits of the product.

As CIOs embrace the product mindset, they will likely need to build new IT capabilities. A CIO in a financial services company hired skilled resources to build strong financial models to estimate the initial investment in IT products and predict the future cost of running, maintaining and upgrading these products. This provided transparency to the finance organization and allowed the CIO to help business areas make strategic choices around technology investments by clearly articulating costs and benefits over time.

### **From ad hoc to industrialized**

About 19 percent of IT budgets is spent on business innovation — activities that create new business capabilities, according to CIOs surveyed. Most is spent on siloed digi-

The majority of IT budget **(55%)** is spent on **keeping day-to-day business operations running**, with **26%** allocated to incremental business change.

tal initiatives and one-off business requests. With ad hoc innovation, many organizations are dabbling in emerging technologies without thinking through use cases and scalability, spreading investments across multiple startups without a broad strategy, or relying too heavily on traditional ecosystem partners and vendors for guidance.

Industrialized innovation is a disciplined, end-to-end strategy that generates an ongoing stream of new technologies and use cases with meaningful business context that can scale across the enterprise. The CIO of a health-care company began investing in startups with the strict criteria to invest only in those aligned with the corporate strategy of developing leading-edge technologies and

solutions in specific markets. Over time, this became an investment portfolio that allowed the company to become a recognized innovator and opened up options to acquire a handful of strategically aligned startups to develop and scale new revenue opportunities.

**Calibrating the shift**

As CIOs start to shift how they think about IT investments, they can ask these questions to help calibrate the current state and map out the journey.

**1 What is technology's value proposition in the eyes of executive management?**

Deloitte's research shows that the CIO value proposition can be summed up in three ways: as a

trusted operator, change instigator and business co-creator. If IT and the CIO are viewed as trusted operators, then the value proposition of IT investments appears centered on cost and efficiency rather than on innovation and change.

**2 How will technology investments impact business financials?**

CIOs can gain credibility by articulating the impact of IT investments to company financials such as EBITDA, revenue or profitability. This can also be an opportunity to engage the finance function or train IT leaders to analyze such data.

**3 Does the current decision structure inhibit innovation and agility?**

IT governance is

often blamed for inhibiting innovation and agility. Many CIOs have modified existing procedures to be more agile in fast-changing business environments. But in some instances — for example, initiatives impacting core business systems — additional governance is needed.

**4 How is investment value measured and communicated?**

Yes, technology can be costly and complex, but it can also provide great value. By clearly understanding and articulating that value, IT pros can help technology spending be viewed as an investment rather than a cost. ♦

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# At GM, self-service analytics drives business results

The automotive giant built a predictive analytics platform to fuel insights across its many business lines, including the emerging market for autonomous vehicles.

BY CLINT BOULTON

**G**eneral Motors has built a predictive analytics platform that generates insights into several core business strategies, including anticipating market demand for autonomous vehicles. Maxis — shorthand for maximizing insights — represents a multimillion-dollar investment in data-crunching technologies that coincides with the company's [IT strategy overhaul](#).



Maxis, which received a [CIO 100 Award in IT excellence](#), is making information accessible for thousands of GM employees, including anyone from business analysts and software engineers to data scientists and C-suite executives, says Les Copeland, GM's CIO of global data strategy, artificial intelligence and analytics services, who oversees the platform. Among its key attributes is self-service analytics, which allows employees to query a Google-like search interface for information about specific business needs, including pricing, incentives and marketing optimization, sales lead management and forecasting, and problem detection.

### Accelerating predictive insights

Using data-as-a-service platforms to democratize information is becoming table stakes. The analytics output of business users with self-service capabilities will

surpass that of professional data scientists by 2019, according to Gartner. More than 3,000 CIOs Gartner surveyed ranked analytics and BI as the top differentiating technology for their organizations.

Roughly 300 GM software engineers worked on Maxis, which includes four main pillars, says

## Using **data-as-a-service** platforms to democratize information is becoming table stakes.

Copeland. The first pillar involves ingesting data — more than 30 billion records (1.5 petabytes) per day. The data comes from internal sources such as applications and internet of things (IoT) sensors from connected cars, as well as external sources from partners and other market forces that make up GM's supply chain. A key challenge to such "hyperingestion" is

ensuring data is "cleansed" and tied to its source system. "Just like any company, we had things to clean up," Copeland says.

The second pillar entails ensuring data is defined well enough so that anyone in GM can use Maxis, from business executives who want to calculate KPIs to data sci-

entists who want to validate their algorithms. "We don't want our data scientists spending hours wrangling data," Copeland says.

Pillar three includes making data accessible via Maxis. Prior to Maxis, GM's analytics strategy involved hundreds of people manually poring over and vetting requests for analytics insights from an array of

employees whose access rights were dictated by their roles. With compliance rules baked in, Maxis automatically vets what information employees can access. "There was a massive shift to change the culture and getting alignment on a new way of doing it," Copeland explains.

Pillar four involves deriving insights to "help the business win," Copeland says. Among the business insights Maxis has generated:

- GM's global purchasing experts used Maxis to identify opportunities for cost reductions that were not visible using conventional processes.
- Teams in customer care and after-sales, quality and purchasing partnered with IT to create data cubes to enable self-service warranty reporting, as well as automated detection and alerting.
- GM's MAVEN mobility and car sharing service uses Maxis to target new customers by identifying characteristics of current customers.



- Maxis informs future vehicle pricing decisions earlier in the development cycle.

- The platform improves the marketing effectiveness of the company's major brands.

- It provides insights for warranty cost recovery, developing intelligent vehicle identification number analysis, and supply/demand balancing.

- Maxis helped diagnose and pinpoint root causes for Malibu 1.5L Turbo engine failure-rate issues.

The platform is also helping GM identify business opportunities for autonomous driving. GM used Maxis to construct data models for a GM/Cruise Automation initiative to forecast potential rates of self-driving vehicle usage in geographic areas, along with geospatial information predicting how autonomous fleets could be deployed in cities in the future.

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## Overall, GM estimates the business benefit of **Maxis exceeded \$100 million in 2017**, with the potential to double or triple that amount through 2018.

\$100 million in 2017, with the potential to double or triple that amount through 2018. “We’ve seen an exponential increase in overall value that business partners can generate on Maxis,” Copeland says.

### Under the hood

GM rolled up Maxis with technology from several vendors, including Microsoft, IBM and Teradata, and a range of open source software tools, including Hadoop, as well as many custom services to support big data ingestion and processing. It accommodates GM’s multiple role-based personas — from business analysts to data scientists — with tools and libraries that generate critical insights. The integrated tool

suite includes SAS, Microsoft and IBM technologies, as well as open source tools such as HUE, Spark, Jupiter, Ignite and others.

Copeland says the Maxis stack, which runs on a private cloud based on Pivotal Cloud Foundry, will evolve as GM identifies new ways to realize competitive advantage using data. For example, GM is layering in artificial intelligence and machine learning tools to make the way Maxis structures data smarter and more relevant, Copeland says. “As these and other methods advance, we will continue to see the opportunity for us to solve complex challenges and identify new business opportunities over time,” he says.

Maxis wouldn’t have been pos-

sible without a significant IT overhaul led by Global CIO Randy Mott. When Mott arrived at the company in 2012, roughly 90 percent of the IT organization and systems were outsourced to HP’s EDS services arm and other IT service providers, with hundreds of apps floating around in more than 20 data centers. But Mott realized GM would be better served to accommodate the growing velocity of the business by building more software in-house. So Mott [hired 10,000 IT staff and began rebuilding IT from scratch.](#)

“Without that transformation, Maxis wouldn’t have been possible,” Copeland says. ♦

Clint Boulton is a senior writer at CIO.