Enterprise

20/20

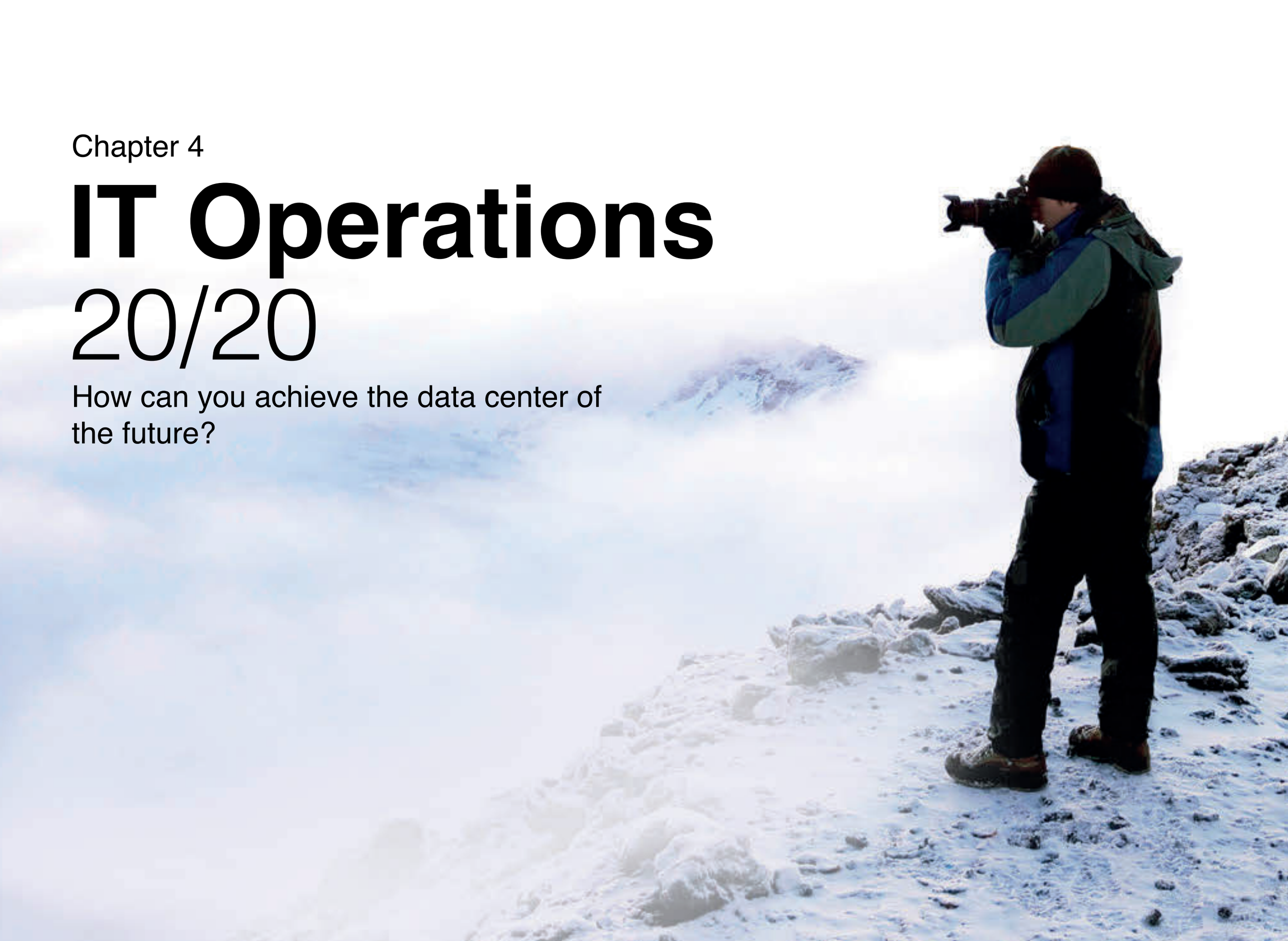
IT OPERATIONS 20/20



Chapter 4

IT Operations 20/20

How can you achieve the data center of the future?



Outlook

V.1 Outlook

Data centers are going away. Your server room is going away. Everything is going to the cloud. Your employees will bring their own devices to work, and you will never have to purchase hardware again. Magically, all your IT needs will be taken care of by third-party providers that can do it better. All of this and more is coming with the data center of the future.

At least this is what some people would have you believe. Reality, however, is poised to look a bit different.

In other Enterprise 20/20 chapters and associated blog posts, we're discussing a more balanced reality for 2020. Here's a summary of some of the community's current views of the data center of the future.

- **Business processes will be composed of services running in data centers and services running in the cloud.** We termed these "hybrid business processes" (see CIO 20/20 and Dev Center 20/20, as well as our blog post on "The resurgence of the business process").
- **Companies will jettison many non-core, non-differentiating applications.** Instead they will focus on business processes and applications that give them a competitive edge. This is discussed in detail in CIO 20/20. There is also a video featuring Geoffrey Moore, chief proponent of the concept, discussing this in Dev Center 20/20.
- **The importance of Dev Ops, in particular the ability to release a new version of your key applications as often as twice a week.** Dev Center 20/20 discusses this.



V.1 Outlook

- **The business importance of Big Data—its collection, analysis and what you do with the information once it's been analyzed.** This is covered Introduction 20/20, CIO 20/20, and Marketing 20/20.

- **How all enterprises will become specialist SaaS providers, supporting their customers and the smart devices they own.** The technology section in Introduction 20/20 and CIO 20/20 go into more detail on this. A recent blog post expands on this concept.

- **How technology systems will increasingly take routine decisions and actions by themselves, only involving us when something out of the ordinary occurs.** This general concept will apply to the IT Operations department of 2020.

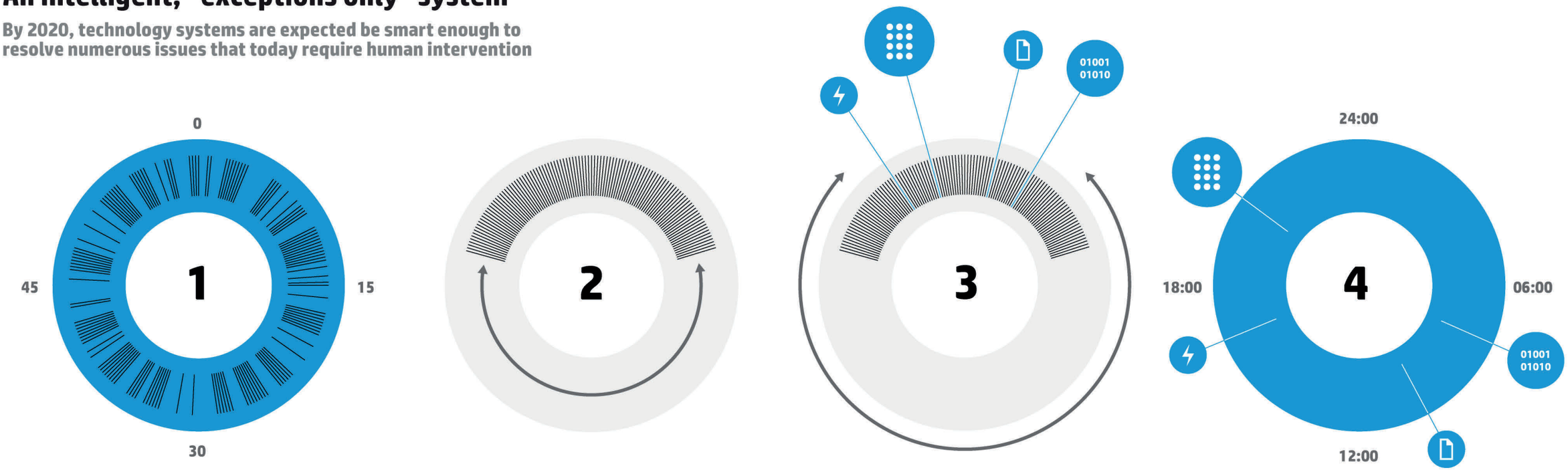
As shown in the diagram on the next page, many of the first level service desk actions that are today performed by humans will be handled by computers in 2020. See the technology section in Introduction 20/20 for further discussion.

In this chapter we focus on the practical aspects of IT Operations in 2020, and the road that is expected to lead there. We look at specific technology trends that the future will bring and how we can best prepare for their impact on IT Operations.

Fig. 1

An intelligent, “exceptions only” system

By 2020, technology systems are expected be smart enough to resolve numerous issues that today require human intervention



Today, IT Ops staff can receive dozens of alerts—ranging from critical to spam—in a single hour.

In an intelligent system, alerts are collected and analyzed in real time to maximize efficiency, energy and bandwidth.

The system isolates the critical alerts that need human intervention.

The alerts go out in batches throughout the day to the people who must address them.

Future shock

Enterprise 20/20 is a collaborative effort with our community members, and their comments help shape each chapter well after it's published. On the following pages we take the pulse of the community and highlight some thoughts from the Discussion Hub.

The Enterprise 20/20 Discussion Hub is full of comments, thoughts and predictions regarding the data center of the future. It's a topic just about everyone has an opinion about, and their ideas show the many ways the data center of 2020 could be run.

Data center directions

What, then, can we expect in the data center of 2020? Will they be completely virtual, with little to no hardware in sight? Will the data center be housed in one location or scattered about in different places and connected via mesh networks? Community members weigh in.

"[Data centers will be] either more resilient to weather or more portable in nature," *predicts James McGovern*. "They may have redundant power sources so that if you put them on the roof, they will not get blown over. If you put them in the basement, they will not flood. The future data center needs to be a location that is mobile in nature."

Thomas Abel has a different point of view: "I think the data center of the future is virtual, managed via software and using globally distributed resources based on underlying contracts to be able to manage unforeseen peaks and needed resources on demand. ... With that you will run the biggest data center in the world just with an app on your tablet used from your living room at home not knowing where the servers you are just using are located in the world," he writes.

"Data centers will become larger and software will be the glue that connects the users to the 'IT services,'" *writes Luigi Tiano*. "Data centers will not 'differ' per se; however, how we use them and who they service could potentially change. The physical data center will need to exist, however these larger data centers will service and support smaller virtual centers from a multitude of customers."

Megasystems

Could data centers be used to manage and optimize "megasystems," or increasingly complex systems coupled with the massive amounts of information they produce? Community members believe much of the future of the data center is dependent on the scenarios in which megasystems are used.

"Yes, there is an interest to concentrate to benefit from scale," *writes Patrick DeMichel.* "The limit of compute is more a limit of moving the data

then we need to compute very close to the source of the data. Then we will see some extremely large data centers. Where they are will depend on many criteria."

"Keeping in mind the systems improvement perspective [of megasystems] that seeks to improve flow and shorten cycle time, we can adapt systems to support and enable new ways of work over time," *notes Horia Slusanschi.* "We need to develop a culture of continuous improvement, in which everyone keeps a sharp watch for opportunities to improve the overall system."

> " We need to develop a culture of continuous improvement, in which everyone keeps a sharp watch for opportunities to improve the overall system."
>
> **– Horia Slusanschi**

Matt Groeninger believes the idea of optimizing megasystems is the wrong approach. Rather, he looks at it this way: "The IT department of the future will need to drive the business practices which extract value for the organization from 'megasystems,' both external and internal.

System optimization depends first and foremost on defining a desired goal. Your statement stems from it being notoriously difficult to tease uniform goals from the competing interactions in a complex system. Fortunately, most organizations do understand their desired outcomes and therefore can interact with complex systems in a fashion that allows

Development and test systems

V.2 Development and test systems

The applications group wants its development and test systems to be spun up quickly—in mere hours. The way to meet this requirement is via the cloud, wherein developers choose from a catalog, their selection is up quickly, they are billed for what they use, and when they are done, the service is taken down and the resources reused elsewhere.

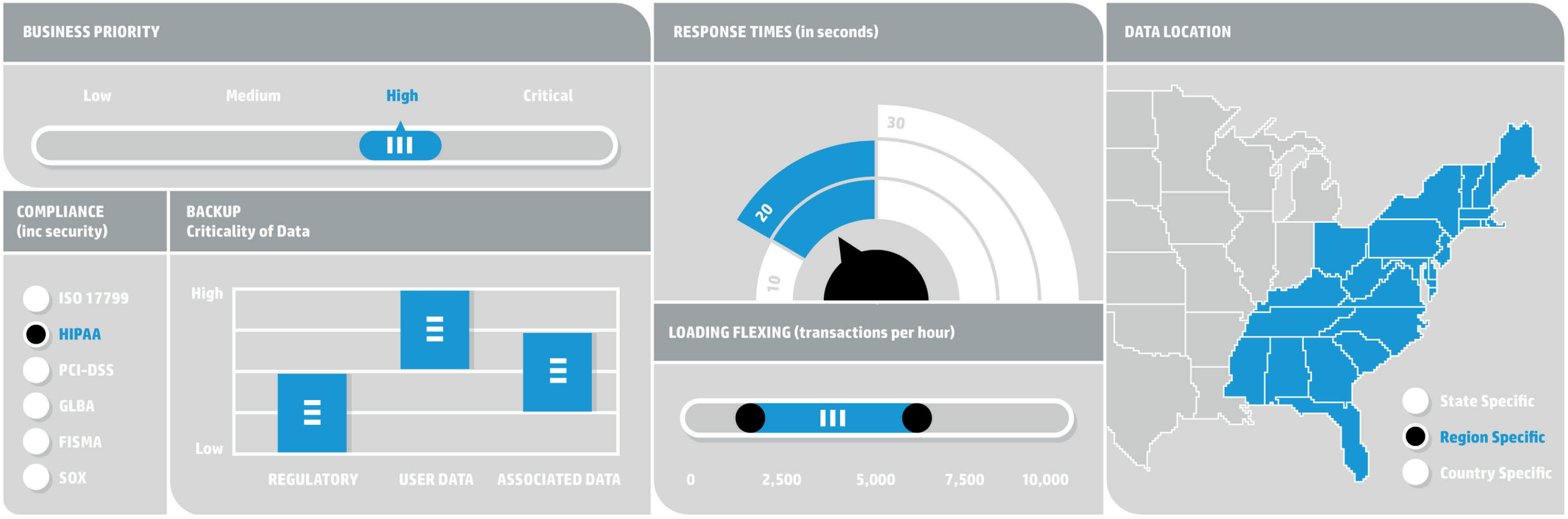
These dev and test cloud services can be internally or externally provided. Which option you choose depends, in part, on the size of your organization. Large organizations can compete on scale with the external cloud providers, and they can also tailor the services they offer to the needs of the development groups, particularly in spinning up the systems to test against. Smaller companies may decide that running development and test systems is not a priority and thus will allow external cloud providers do it for them.



Fig. 2

Specifying a production environment

By 2020, we should be able to empower business analysts to set parameters on production platforms through something as simple as a dashboard



V.2 Development and test systems

As Chris Purcell, Manager, Cloud Go to Market and Enablement at HP, and Johnathan Sharp, VP of Marketing at HP partner Latisys, write in a recent post on Grounded in the Cloud, most enterprises won't necessarily go all in on cloud today, and that may still be the case in 2020. "Most enterprises today don't need the whole enchilada," Purcell and Sharp write. "They do have legacy hardware and applications (and competencies and talent and advantages!). They do have some workloads that need to be on-premises. Rather than the whole enchilada, they just need, if you'll permit us to extend this metaphor almost beyond its breaking point, a side of nachos."

Your choice also depends on the focus of your IT Operations group.

What is your IT Operations focus going to be?

In 1990, IT ran all the computing systems that the enterprise needed. Then, some enterprises went to outsourcing and someone else operated selected infrastructure components. By 2020, many—if not all—services are expected to be sourced from the cloud providers. The business processes and applications that generate differentiation for the enterprise probably will contain a mix of cloud and internally hosted services.

By 2020, IT won't be able to do it all. If you try, you run the risk of letting down the business and you may set yourself up for an ongoing battle against external cloud providers.

You need to ask yourself, "In what ways does the business rely on IT to differentiate itself?" This gives you your focus. For example, a differentiation of "ultra-fast turnaround of new application functionality" may result in a focus on an internal cloud for development and test. A differentiation of "ultra-high up-time" may mean a focus on production systems with very high uptime and fast recovery from disaster, which is tough to do with public cloud.

Jim McGregor, founder of Tirias Research and former chief technology strategist for In-Stat, affirms that a hybrid cloud approach makes the most sense for enterprises in 2020. "There are single-function examples like Netflix that can sit in the public cloud, but the vast majority of Global 5000 companies will have hybrid business processes and applications for which some parts will run in the data center, and some parts will run in the cloud," McGregor says.

Dev Center 20/20 and a recent blog post talk about the idea of "hybrid business processes" in more detail.



What about PaaS (Platform as a Service)?

In broad terms, there are two types of PaaS offerings. There are focused PaaS offerings associated with specific SaaS products. For example, Force.com helps users create solutions around the SalesForce.com application. And there are more generic PaaS products like Microsoft's Azure or Google's App Engine.

There is a trend for generic PaaS platforms to add more and more abstraction, allowing programmers to focus simply on coding, without having to worry about exactly how their application will be deployed and managed. By 2020, we will likely have arrived at a point where a business analyst specifies performance, performance flexing limits, data recovery times, compliance, security and anti-virus scanning requirements and other KPIs, which the production platform then meets automatically.

Such abstracted production platforms don't have to be sourced via public cloud. The vendors of these platforms often will offer the option to run their products in house.

PaaS promises much, but it's in its infancy right now. But keep an eye on such generic PaaS offerings as Microsoft, Google, Amazon, and VMWare and play with the technology by running a platform yourself to understand the "public vs. internal" tradeoffs.

Focusing on core production systems

V.3 Focusing on core production systems

IT departments sometimes want to own everything. But by 2020, the SaaS offerings for generic business processes such as HR, expenses and travel should be so good that an “IT does everything” approach will feel somewhat like defending a large and crumbling empire against attack on all fronts. In a word, impossible.

In 2020, CIOs and IT decision makers need to be part of the planning process regarding the adoption of SaaS to make sure skilled operations staff don’t disappear should non-core applications move out of IT. What is your CEO’s view on those applications that don’t differentiate his organization? Does he want his IT organization to focus on generating as much differentiation for the business as possible? What applications do the CIO’s office and the applications team plan to send to SaaS?



Production systems to run hybrid applications and business processes

V.4 Production systems to run hybrid applications and business processes

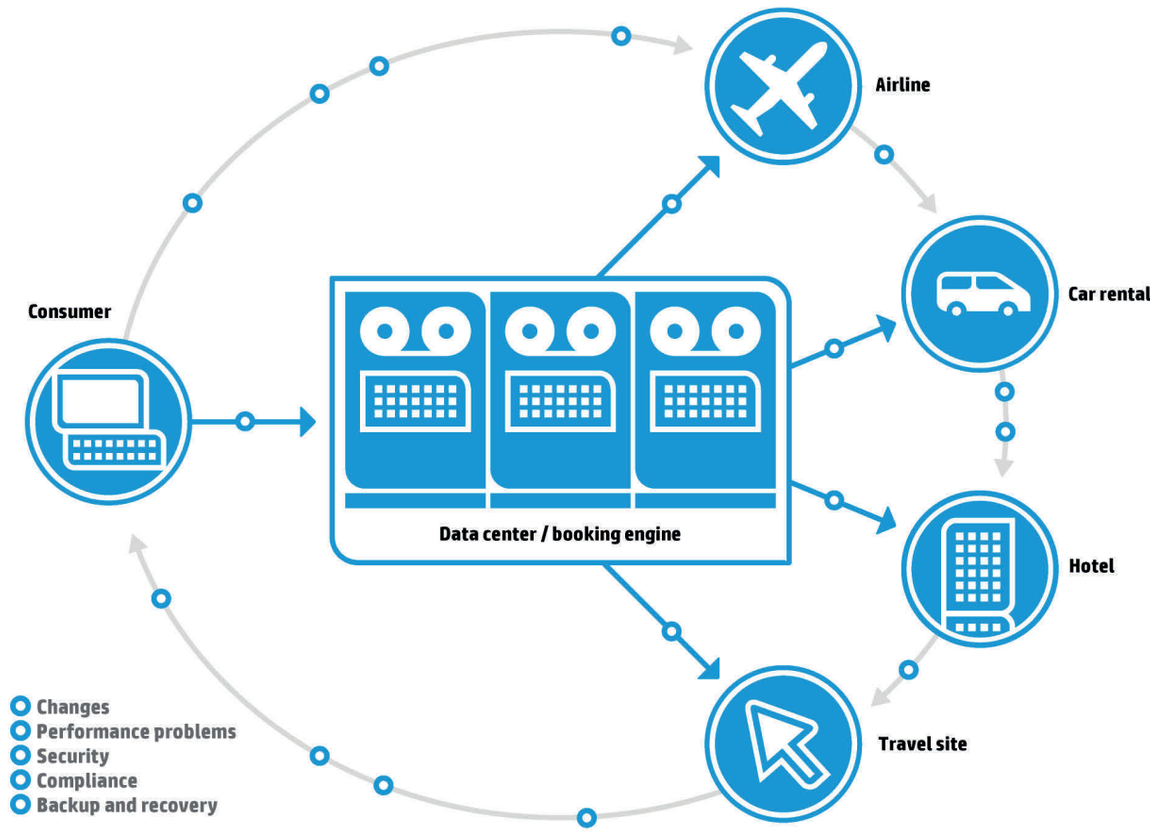
The implications of hybrid business processes and applications on IT Operations are profound:

- You need to be able to manage application availability and performance from the data center, out to the cloud and back again. Solving knotty performance problems in such a situation will be difficult.
- You need security across hybrid apps. For example, say someone is terminated from an organization effective immediately: The data center and the cloud systems need to know this simultaneously so the person can't do damage to systems that still allow him access.
- You need to monitor end-to-end compliance—how can you certify combined compliance across both your data center and cloud services you don't own?
- You need to put in place automated provisioning of hybrid business processes and applications. How do you ensure the cloud provider has done what you ask? How do you back out automated changes against a cloud service should you need to roll back?
- You must be able to hand off incident, problem and SLA service management to multiple cloud providers.
- You need to ensure backup and recovery of data at the application level across a hybrid landscape.

Fig. 3

Hybrid application management

By 2020, IT Ops must be able to manage application availability and performance from the data center, out to the cloud and back again, as in this travel itinerary booking example



V.4 Production systems to run hybrid applications and business processes



When making new management system purchases, you now need to ensure you can integrate them with your hybrid applications and cloud suppliers.

Start to play with hybrid applications ahead of being asked to run them. As McGregor observes: What you believe you can do in theory may not be achievable in reality. “Data communication bandwidth may limit the use of cloud,” he says, offering an example: “If you have to pass masses of data between two process steps, one in the data center and the other in the cloud, the theoretical advantage of cloud may be eroded.” You need to have trained hybrid deployment experts by the time the application development team comes to you with its first hybrid application or business process.

“If you have to pass masses of data between two process steps, one in the data center and the other in the cloud, the theoretical advantage of cloud may be eroded.”

– Jim McGregor, founder of Tirias Research and former chief technology strategist for In-Stat

New ways of working

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> The cloud offers myriad possibilities for companies to approach operations. Even companies adopting hybrid cloud models stand to benefits in the way of reduced cost and complexity, not to mention the manpower needed to manage on-premise data centers and applications.

Shifting gears

Will companies move completely away from an "IT does everything" approach of operations to a cloud-based model? Or will certain tasks remain in-house because of legal or technological restrictions? Community members have their say. "Whether it is done in-house or via an external third party, it is still IT," *notes James McGovern*. "What differs is the logo on the paycheck of the person doing it. What shouldn't differ are things such as SLA, security/ incident response, capacity planning, etc."

"Moving IT from doing everything to doing nothing? Or, in other words, you do not need anymore IT since you work directly with your cloud service provider? Maybe the answer is 'yes' regarding things IT does today. But there are new or other activities needed to support people regarding IT services coming from the cloud," *writes Thomas Abel*. "The activities done by IT people today will be reduced, disappear or change. The IT manager [role]might become more project-related than today. Job profiles will change."

Hands off

As IT operations then become less an on-premise activity and move (at least partially) into the cloud, will IT Ops adopt a completely hands-off model, instead outsourcing anything feasible?

"I think the consumerization of IT (or BYOD, or whatever you want to call it) is a market response to traditional IT's inability to respond nimbly to business needs," *writes Joshua Brown.* "Now, the emergence of cloud solutions is not fully mature, particularly from a security perspective, nor are consumer-grade solutions or electronics necessarily appropriate to meet security needs … but they *do* meet users' functional needs.

V.4 Community discussion highlights

IT needs to take a page from this playbook. Instead of being the department of ‘no,’ they need to observe what users are trying to achieve and find ways to enable those activities. In other words, IT needs to be an enabler for the business.”

> “ Instead of being the department of ‘no,’ [IT] needs to find ways to be an enabler for the business.”
>
> **– Joshua Brown**

“Why is my email is so limited? This is ridiculous; I can have much more from external free services! I want the same tools at home and work, and I am ready to pay for my own internal email because it causes me so much trouble,” *writes Patrick DeMichel.* “Same thing for search and creativity tools: Our tools are prehistoric, and a huge waste of our potential.”

McGovern responds: “What is silly is not the size of the mailbox in the strict sense but the simple fact that we have a limited mailbox that each and every one of us empties by moving it to local folders which we then backup on an unlimited storage medium. It’s not the size but the ceremony that bothers us.”

Availability, performance and flexing systems

IV.5 Availability, performance and flexing systems

By 2020, IT infrastructure should be great at figuring out where performance problems lie and automatically adjusting for them. Better still: The infrastructure should be able to preemptively grab what it needs before any performance problem can occur because it will have the intelligence to predict what resources it will need in different situations.

By 2020, we will have arrived at converged infrastructure across the whole data center. The data center will be a huge mass of resources that can be applied to any application as required.

The key to such performance flexing is a business-aware resource allocator. There always will be finite limits on your data center resources, but this business-aware resource allocator can decide who has the most business-critical need for resources at any given time.

There are a number of things you can do in preparation for these systems designed to automatically performance flex:

- When making IT management buying decisions, ensure the technology is able to use intelligent analysis to truly know where problems lie. Automation is relatively easy once you know where the problems are. Without this knowledge, automation is more dangerous than helpful.
- Look for systems that automatically adjust resources, predictively, based on previous behavior patterns.
- Business analysts should look for a business-aware resource allocator that can front applications' requests for more (or fewer) resources. Formulate a process with the business by which the rules for such a resource allocator will be determined.
- Experiment with "cloud bursting" to learn what it is good for, and when bandwidth limitations make its use impractical. If you believed the marketing hype around bursting, you'd think that it required no effort to set up and could be used for any part of any application. This is simply not true—at least, not in 2012, and possibly not by 2020.
- Look for generic PaaS systems that allow you to specify the run-time characteristics of the platform upon which applications will run—performance, performance flexing, compliance checking, security, anti-virus, backup and recovery speeds, and so on. We are not there yet—but we will be by the time we get to 2020.

Dev Ops

V.6 Dev Ops

Dev Center 20/20 talks about the business need to move to twice-weekly application updates by 2020. While external cloud providers may crow about your hybrid business processes, don't forget they are also your competition. Nothing will give them a greater advantage than the ability to put applications into production with lightning speed.

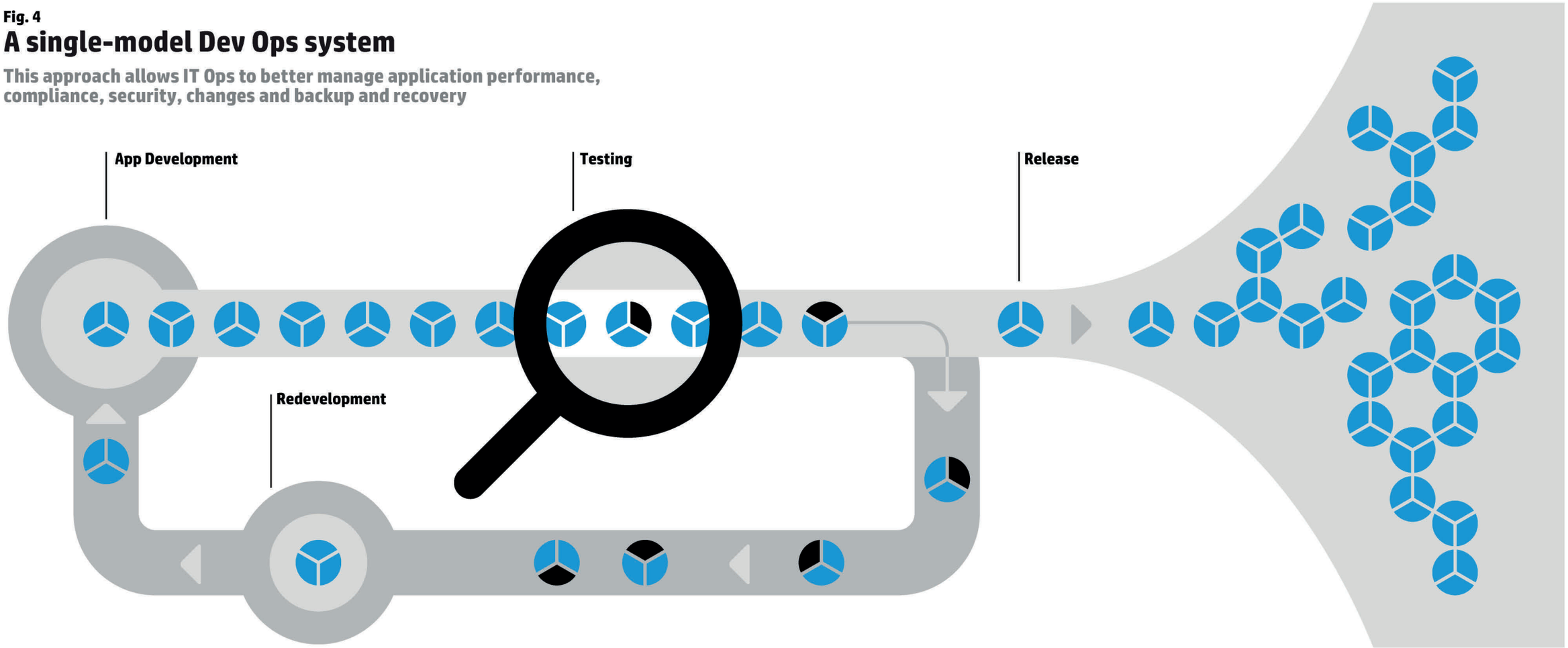
You must embrace the concept of Dev Ops to support this twice-weekly frequency of new application deployment:

- Get your team's objectives changed. The dual objectives of "don't screw up" and "be as cheap as possible" don't help you achieve Dev Ops. You must have "speed of app deployment" in your objectives, and make sure the development team has this same goal.
- Move to a single model that is used in application development, testing and, with "run-time bindings," in production. Find development, test and production management solutions that support this concept. You need a single model because it cuts out remodeling work, and makes it possible to automate the steps in the full application lifecycle. The single model concept is key to the IT Operations side of Dev Ops because it means that when applications move to production you'll be able to manage their performance, compliance, security, change, backup and recovery and so on instantly.

Fig. 4

A single-model Dev Ops system

This approach allows IT Ops to better manage application performance, compliance, security, changes and backup and recovery



Big Data and unstructured data



V.7 Big Data and unstructured data

Everyone agrees we will see huge growth in “Big Data” by 2020—an increase in the granularity of the information that is stored and the continuous amassing of unstructured audio, video and social media.

By 2020, it’s expected that computers will be able to hold huge amounts of data “in memory” using such technology as memristors.

Gary Thome, VP of Strategy for servers at HP, believes there will be a shift in emphasis from using IT infrastructure to support applications to using IT infrastructure to support data and its analysis.

“The economics of keeping data around to dig into later are getting better in the sense that there’s business justification to keep and mine data. Enterprises need to leverage the data they have—what we will be able to get out of it are things we can’t even imagine today,” Thome says.

That means that by 2020, there is expected to be a strong demand for IT Operations staff who can architect big data infrastructure systems.

“Enterprises need to leverage the data they have—what we will be able to get out of it are things we can’t even imagine today.”

– Gary Thome, VP of Strategy for servers at HP

Big Data, big questions

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> The emergence of Big Data poses some important questions: Can IT operations handle the influx of Big Data and unstructured data? How will it harness the wealth of information—and business opportunity—that can be derived from Big Data? What processes must change to take advantage of what Big Data promises?

Go big or go home

Community members believe not only that companies must be able to manage Big Data in all its forms, but also we have only begun to imagine what can be gleaned from such massive amounts of information.

"I don't know why we are calling Big Data 'BIG' when it is a microcosm of the size it will be in 2020, and when the largest segment of data will actually be media. By the time 2020 arrives we will be talking about a different form of equivalency," *notes manjit 20/20*.

"Big Data is a tricky buzzword. At this point, it is evident that data will continue to grow exponentially," *writes Luigi Tiano*. "Very soon, Big Data will simply be called data."

He adds: "Data collection, processing and consumption will grow at an exponential rate year after year. Many companies seem to think that this can become a burden to manage all this data. Big Data should not be considered a challenge. In reality, it is about the opportunity that today we can turn this huge amount of data into business insight and value."

Thomas Abel believes the issue with Big Data won't be the amount of information, but how the information can be read and interpreted. However, he says the benefits of harnessing Big Data far outweigh the obstacles. "The challenge will be to define the new rules for analysis by the business to get the needed information. Rules like never possible before can be defined and applied to the available data sources. With that, marketing, sales and others have real-time information available to react and manage their processes ad hoc, being able even to make markets and to act instead of reacting to what happens in the markets with huge delay."

V.7 Community discussion highlights

Ownership status

As Big Data and cloud services impact IT operations, the way enterprises handle testing and development will change as well, community members believe. So who will own the dev, test and production systems?

> “ Very soon, Big Data will simply be called data.”
>
> **– Joshua Brown**

“In 2020, I hope to have cloud capabilities running in my basement and hope to be running 100 percent open source development tools locally,” *writes James McGovern.* “Compute capacity in terms of home networking will also grow where we can rent out idle time on our home infrastructure as well.”

“I think you will have all kind of variants and combinations,” *believes Thomas Abel.* “You should define packages of combinations optimally adapted regarding services and pricing to your customer groups and segments. The process to define your products starts with your customer segmentation.”

Big Data poses as many questions as answers, but community members see a bright future in Big Data. Same goes for the cloud’s role in testing and development systems. Who knows? Maybe end users one day will run their own basement testing and development environments.

Enter the enterprise infrastructure store

V.8 Enter the enterprise infrastructure store

In Dev Center 20/20, we talk about the rise of the Enterprise App Store.

It is critical that IT Operations puts in place an equivalent store for infrastructure services for use by application development teams. The Enterprise Infrastructure Store should contain platforms (Jive, for example) that can be used for the creation of solutions. It should contain the services developers can order for development, test, staging and production environments. And it must offer billing that reflects usage so IT costs to the business can flex with demand.

You need to establish a process around the selection of this store's contents. You will get requests from the business and from application development teams. You need to respond quickly to these requests, while ensuring that you keep a good balance across your whole portfolio of store content. In addition, you also will need to govern your digital suppliers.

Digital supplier governance

V.9 Digital supplier governance

By 2020, enterprise IT will have hundreds of “digital suppliers”—suppliers of cloud services at the application, platform and infrastructure levels. You will need robust, fair, optimized supplier management across this portfolio of suppliers:

- Put in place a supplier selection process that is fast; otherwise the business will make your decisions for you. That said, you must balance speed of response against the need to make decisions that are safe for the enterprise.
- Pay attention to your overall service costs and the relative costs of digital suppliers. If there is a market for a cloud service that has a low switching cost, you may find you can get the service cheaper from a different supplier.
- Set up ongoing digital supplier monitoring with respect to service performance, responsiveness to service management process requests (incident, problem, change, etc), compliance, privacy and security. Without these checks in place, you run the risk of your own business suffering from a weakness of one of your digital suppliers.

Everyone will become a SaaS provider

V.10 Everyone will become a SaaS provider

In Introduction 20/20 and CIO 20/20, we talk about how most enterprises will become specialist SaaS providers. We also expand on this in a recent blog post. These SaaS offerings take the form of applications that users can access to add value to the enterprise's products. Also, there will be an increase in the number of smart devices that will "call home" for information and link to other smart devices. The "home" that they call also will be a cloud service.

As the IT Operations department, you have to decide what part you want to play in running these SaaS offerings. Do you want run the SaaS service, taking in the revenue? Or, should a business-computing unit do it, with your guidance? Or, should a service provider do it for you—if you're a small company, the service provider probably will have the scalability and billing systems that you may not be able to justify putting in place yourself.



Explosive net growth requires continued focus on security and privacy

V.11 Explosive net growth requires continued focus on security and privacy

It is estimated that by 2020, there will be around 5 billion people with access to the internet—nearly double the number accessing the Net today, which, according to Internet World Stats, is about 2.5 billion.[1] The majority of this growth is expected to come from Africa and the Middle and Far East. Even if a portion of these new Internet users becomes hackers, there will be millions of new hackers in the world. “The Internet is already a hostile place. By 2020, it is going to be far more so,” says Patrick Goldsack, a Distinguished Technologist in HP’s Cloud and Security Laboratories.

“The Internet may be such a hostile place by 2020, that there may be a number of ‘walled garden’ Internets, shielded from each other.” Goldsack offers mobile apps as a primary example: “By 2020, I would guess that there will be something like 20 million mobile applications available. Malware is already starting to creep into mobile apps. With this huge increase in app numbers, the malware problem on mobile devices will be very serious unless we take active steps to control it.”

“The Internet may be such a hostile place by 2020, that there may be a number of ‘walled garden’ Internets, shielded from each other.”

– Patrick Goldsack, Distinguished Technologist, HP Cloud and Security Laboratories

V.11 Explosive net growth requires continued focus on security and privacy

Despite these threats to mobile devices, employees will increasingly insist on being able to bring their own devices to work (BYOD, as it's called). Companies most likely will be inclined to allow this, but they cannot allow such "dirty" devices to pollute corporate networks, Goldsack says. "Devices will have to be fully virtualized, with support from trusted hardware to enforce and validate the separation of personal and corporate data. The many personalities that users need to adopt, both work and personal, will be kept well isolated. This will enable an enterprise to manage their partitions and the applications within them without affecting, or being affected by, the partitions used for personal use such internet browsing or playing games."

> **"Cloud computing differs from Traditional IT in the control of managing risks to the business. This is now delegated to a commercial agreement, i.e. a contract with the suppliers."**
>
> — Roger Lawrence, Chief Technologist, HP Strategic Enterprise Services

By 2020, business processes will be moved to the cloud, using software or infrastructure services. These services may, in turn, call other cloud services, creating chains of dependency, some of which may be hidden to the users. This disaggregation of IT has significant implications: Providing security and privacy, tracing accountability and ensuring compliance through these chains of calls is going to be challenging—but essential.

With the move to the cloud, we'll probably end up with very large, homogenous cloud providers. "This is a perfect target for hackers, maybe through infecting the open source management tools that cloud providers use, or via rogue cloud provider employees," Goldsack says. "After all, the scale of the impact is in direct relationship to the effort someone will be willing to expend, and an attack could take down thousands of services in one go."

Roger Lawrence, Chief Technologist, HP Strategic Enterprise Services, raises this concern in a recent post in Grounded in the Cloud.

V.11 Explosive net growth requires continued focus on security and privacy

Along the same line, by 2020, there are expected to be more than a trillion sensors, actuators and other smart devices, many of which will be physically accessible to the public. “This leaves them vulnerable to various types of attack, including physical tampering,” Goldsack adds. “They could be made to feed us false data or could be given false commands. Also, unless the firmware for smart devices is well protected, it could be modified by a hacker. This is changing quickly, as the business computing teams that build and support the smart devices and sensors of the future take cues from IT Ops and proactively secure these smart devices to protect users’ privacy.

In CIO 20/20, we talk about the disaggregation of the enterprise and the increased use of affiliates in project teams and supply chains. One of the “currencies of collaboration” for these teams is unstructured information, such as documents. “We don’t want everyone to see everything,” Goldsack says. “So we have to create sharing models that allow us to define policies regarding who in our collaboration circle can see what and when.”

IT Operations and security

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> With all the talk about Big Data, cloud computing, unstructured data and user-centric testing and development, it's only natural that security would become a hot topic. Security touches on all points of IT operations, from data center management to application delivery, and it's a critical element in any company's data strategy.

Internet Edens?

Sometimes, even the best-laid plans aren't enough for cybercriminals bent on infiltrating and destroying corporate networks. Some believe a "walled gardens" approach for the Internet will help keep networks somewhat safe.

Community member *James McGovern*, however, has a different point of view.

"There are many that believe a Walled Garden doesn't just keep people out, but locks people in and therefore is never a solution in a society that values liberty and freedom over security," he writes. "Be fearful of advocates of these types of strategies as they may be the enemy from within."

Waging cyberwar

But community member Mike Shaw wonders whether we are on the verge of cyberwar, as factions worldwide perpetrate nefarious acts on corporate networks and users.

"Yes, always," *answers beemaraj*. "We should adopt/implement effective security mechanisms to protect our data. We can think of multi-layered authentication with the following combination (probably more) thus making our network/data more secure: 1. What you know (PIN, password); 2. What you have (ActivKey, OATH token); 3. What you are (fingerprint, iris)."

"But please let not the user pay the price for security," *urges Thomas Abel*. "Security checks in 2020 should be done automatically without [users] having to do anything."

V.11 Community discussion highlights

He adds: “Since business processes get more and more digitized and sensitive for cyber attacks, the security risk has to be strongly prioritized and managed by each company, government or organization. There is not very much time to prepare for that since cyberwars are already here.”

To some, the idea that their networks are being targeted by cybercriminals is beyond imagination. To others, it’s obvious IT Operations must play a major role in ensuring their networks are protected from attacks, both inside and outside the company walls.

Operational technology merges with IT infrastructure

Today, the systems that control our factories, transport systems and power plants use infrastructure that is separate from that of IT systems. But it looks as though by 2020 they will use the same infrastructure.



V.12 Operational technology merges with IT infrastructure

“ Every automobile, every trellis in a vineyard, every end of a corn row—everything in every industry will have sensor networks.”

– Stephen DeWitt, senior vice president and general manager of the Enterprise Group at HP

Further, by 2020, we should expect to see a large number of high density sensor arrays in use for traffic, environmental, fire and crime control, to name but a few. These sensor arrays will send their data back to central control systems in the cloud. “Every automobile, every trellis in a vineyard, every end of a row of corn—everything in every industry will have sensor networks,” says Stephen DeWitt, senior vice president and general manager of the Enterprise Group at HP. “It’s estimated that by 2020 there will be more than 1.3 trillion sensors out there. There will also be more than 28 billion devices[3] held by the 7 billion-plus people in the world.”[4]

To prepare for this convergence, make sure you have someone tracking the merger of operational technology with IT infrastructure. Operational technology has special requirements, real-time responsiveness, and you may need to update networking infrastructure and other technologies to support them.



Merge ahead

Enterprise 20/20 is a collaborative effort with our community members, and their comments help shape each chapter well after it's published. On the following pages we take the pulse of the community and highlight some thoughts from the Discussion Hub.

> The impending merger between operational technology and IT infrastructure will bring to light many of the concepts discussed in IT Operations 20/20 about Big Data and unstructured data. Community members agree: The question is not whether it's going to happen, but when.

Other predictions

Community members have other ideas about the future of IT Operations, especially around cloud computing and related services.

Community member *James McGovern offers* his list of IT predictions, including the belief that by 2020, cloud will no longer be a conversation point. Rather, services will rule the day. "The cloud will be irrelevant. Software-as-a-service will be a key area of focus," he believes. "Early cloud companies have realized that the game of commoditization has caused almost no one to make money. As compute and storage density increase, consumers will have more power in their cell phones in 2020 than the entire cloud today. Users who have personal computers that can store terabytes of data will now have sufficient compute available locally and need not worry about lower-level infrastructure. Applications will still be challenging to deliver and therefore the value will be in SaaS."

James Bertsch sees a different scenario. "Networking and the cloud will become the dominant theme. Disaster recovery is handled by moving everything to the cloud," he writes, adding, "Data centers disappear, and application development moves to consulting firms. The IT staff disappears entirely from the organization."

"You both have very interesting thoughts on this topic," *comments Doug Nelson*. "Unfortunately, you can't both be right, or can you? I think what you've spelled out will actually all be provided in a hybrid model. The cloud isn't dead, but it isn't truly profitable."

Does size matter?

Does the future of IT Operations change depending on the size of the company? Community member *Thomas Abel*

believes it doesn't make sense to group IT functions based on how big —or small— a company is. "I think the criterion to distinguish is not small or large IT, but which kind of services and how many services IT has to provide to which kind of customers," he notes. "IT should classify their services and customers in categories and manage their service decision (public cloud, private cloud, other) based on the category of their considered service and customer (not important if it is a large or small IT)."

> " The criterion is not small or large IT, but which kind of services and how many services IT has to provide to which kind of customers."
> **– Thomas Abel**

A big production

Perhaps more important than size of the company, community members predict, will be the types of production systems that

"Typical applications or services from production systems that might not run in the public cloud might be HR applications with their services or financial reports as a service," *writes Thomas Abel.*

It's difficult to predict the future of IT Operations. but the Enterprise 20/20 community has a lot of fun trying.

Moving toward IT Ops of the future

V.13 Moving toward IT Ops of the future

The year 2020 won't arrive in a sudden flash and puff of smoke, Harry Potter style. We will evolve toward it. But knowing where we are likely to be by 2020 allows us to take steps on the road leading there.

One important step is choosing the right focus for IT Operations. The days of "everything computing" being run by IT are gone.

By 2020, a lot of your screen-watching, run book-viewing staff likely will be gone. So will practically all of your first-line service desk staff, who likely will have been replaced by automated systems. Instead, you will need hybrid application experts, big data experts and on the like. We therefore need to gradually but permanently change the skills profile of the IT Operations team to prepare for 2020.

It's also a good idea to assemble your own marketing team. Cloud providers will sell heavily to your CIO, CFO and CEO. For these executives to get a balanced view of cloud and its role in hybrid IT, you will need to be able to counter the marketing might of the cloud providers with your own marketing muscle.



Future cast

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IT Operations 20/20 has provided much food for thought in the way companies will run their IT operations in the future. Should companies in-source or outsource? What's best: private, public or hybrid cloud? Will IT Operations exist as we know it today?

Big Data redux

Community members believe Big Data will play a critical part in the future of IT Operations. What's less certain is how Big Data and the way we interact with data will change the face of IT Operations.

"IT operations will provide and use apps to analyze Big Data and make the analysis results available for the IT operations itself and the business to drive the IT operations and the business in a better and more target-oriented way," *writes Thomas Abel*. "The possibilities and opportunities to make business based on Big Data analysis are amazing and nearly endless."

"IT operations will provide and use apps to analyze Big Data and make the analysis results available for the IT operations itself and the business to drive the IT operations and the business in a better and more target-oriented way," *writes Thomas Abel*. "The possibilities and opportunities to make business based on Big Data analysis are amazing and nearly endless."

Doug Nelson offers a different point of view: "This is correct, but we also must now start to look at the overall impact this has on consumers. The more Big Data is captured and tracked the more consumers push back.

"When the rubber hits the road, IT Operations has to support the delivery of services to the business," *adds Marc Wilkinson*.

Big Analytics help with all three, by handling the volume and mixture of structured and unstructured data or by providing the right information in an easy-to-consume manner."

Be prepared

Will Big Data be able to help IT Operations in other areas as well? Community member *James McGovern* wonders whether organizations will be prepared to meet the challenges brought on by Big Data and other emerging technologies.

V.13 Community discussion highlights

Chief among those challenges, *McGovern notes*, is rapid deployment of applications.
“Ever read into how fast the likes of Facebook and Netflix can deploy new functionality to their website? Compare this to how long it takes to release an enterprise application in many corporations,” he writes.

> If your customers are big business, they do not like or want rapid change. But if your customers are normal people, then you need to be very fast.”
> **– Daniel Martin**

“The way I see this is that the actual issue isn’t the differences between ‘rapidly deployed software’ and ‘enterprise software’ but the differences between ‘new technology firms" vs. ‘old school technology firms,’” *writes Doug Nelson.* “Old school organizations organizations have been around for a very long time and their infrastructure and processes are deeply seated in historical processes, where the ‘new technology firms’ aren’t entrenched in the old processes and by their actual organization age aren’t tied into ‘legacy’ systems. Match ‘legacy system’ with outdated and corporate processes and you arrive at slow movement and releases.”

Daniel Martin posits: “If your customers are big business, I can tell you they do not like or want rapid change. ‘Rapid’ or ‘urgent’ is measured by them in weeks or months, while the normal life time of a product (software or hardware) is measured in years.”

IT Operations in 2020 promise a future of different possibilities —opportunities and challenges. Community members believe IT Operations stands to benefit from the new technologies and strategies flooding the enterprise. How a company reacts to the changes, however, will determine its ultimate success or failure.

V.14 Sources

Text

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