Fast IT: Accelerating Innovation in the Internet of Everything Era

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By implementing a Fast IT model, IT can potentially capture a 20 to 25 percent reduction in costs. These savings can be redeployed to address new capabilities, freeing IT to innovate and become a trusted partner with the lines of business to drive business outcomes. This evolution will enable more agility and speed for business transformation. And through the connection of people, process, data and things, it will create an organization that is truly ready to compete in the Internet of Everything (IoE) economy.

Executive Summary

Today's IT organization is challenged as never before. Operational costs are rising as budgets fall. Pervasive mobility and an explosion in connected devices are supercharging complexity. And business users are bypassing IT to access cloud-based services. Further heightening CIO stress is an ever-changing landscape of new security threats.

Of course, technology is also a critical component of any organization's success. So, it is essential for IT organizations to change on a fundamental level if they are to help their companies innovate and seize new opportunities.

Today, IT must execute a step change in operating efficiency (costs), business enablement (agility), and security. The IT organization itself must become both a source and a facilitator of disruptive innovation — pivoting with the company as it changes business models on the fly, and responding to a dynamic world of increased complexity and new wellsprings of value. This requires a new model for IT, which we call *Fast IT*.

- Fast IT simplifies operations at a time when complexity is mounting — and IT budgets are flat. By offering automated, programmable, and agile infrastructure, Fast IT frees IT organizations from manual configuration, changes, and maintenance.

- By implementing Fast IT, organizations can move seamlessly through a "fabric of clouds," whether on-premise and off-premise, physical and virtual, fixed/mobile, or private cloud combined with public cloud. Workloads and infrastructure tasks shift as business (application) conditions warrant.

- Fast IT fuels much faster provisioning of enterprise applications. Time to provision and scale can decrease from months to minutes, allowing any IT organization to move at the speed of cloud to meet business needs.

- Fast IT builds cutting-edge processing capabilities at the edge of the network, capturing "data in motion" for real-time decision-making and contextual insight. This data, along with infrastructure data and analytics, gives IT the tools to transform business processes and end-user experiences.

- With Fast IT, security evolves to a more platform-driven approach in which visibility is improved across all infrastructure domains, devices, applications, and services — enabling protection before, during, and after attacks. Policies protect users and data.

Introduction: The Internet of Everything

No matter what the industry, disruptive innovation is rampant. And competitive upheaval is now a constant. In this new reality, the biggest threat to your business may very well not come from customary rivals. It could be cooked up in a garage and executed by a small startup. Or it might arise from an organization that once seemed safely rooted in a whole other industry.

The Internet of Everything provides a superb opportunity — and an urgent imperative — for IT to accelerate innovation.

The digitization of business is in full swing, and is playing out in the competitive landscape of nearly every sector of the economy. In this atmosphere of pervasive disruption, every firm must be highly innovative and agile enough to respond to rapidly changing business demands. In short, the Internet has changed, companies are changing, and now IT needs to change. The driver behind this far-reaching transformation is the Internet's next wave, the Internet of Everything (IoE). IoE represents an explosion in connectivity among people, process, data, and things (http://internetofeverything.cisco.com/). Cisco estimates the number of connected "things" in the world will surge from about 13 billion today to more than 50 billion in 2020. And as these "dark assets" are "lit up" with network connectivity, and people, processes, and data are connected in new ways, unprecedented change will be the norm for nearly all firms — in turn, placing unprecedented burdens on IT.
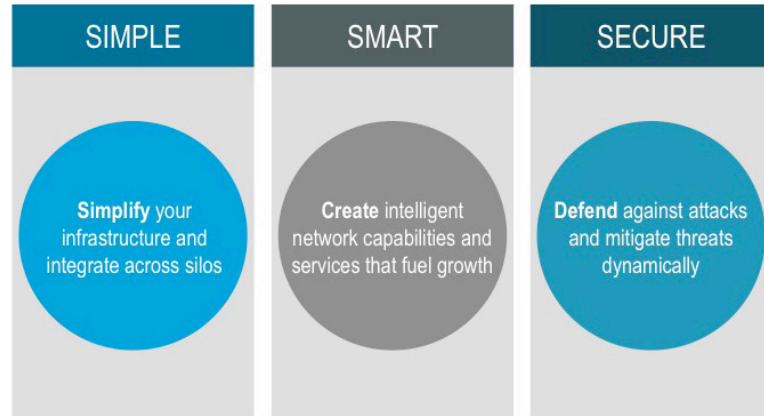
IoE and the notion of "connecting the previously unconnected" present staggering economic opportunities. Cisco projects the total IoE-related Value at Stake over the next 10 years to be $19 trillion (http://bit.ly/N090Dc). That's $14.4 trillion in private sector industries, and another $4.6 trillion in the public sector. The total Value at Stake includes net-new value created (i.e., spawning markets that could not have existed before), but also an IoE-driven migration in value (41 percent of the total) — in other words, value moving from losers to winners.

IoE provides a superb opportunity — and an urgent imperative — to accelerate innovation. The ability to harness the technology transitions that make up IoE — cloud, mobility, social media, analytics, security, the Internet of Things (IoT) — will determine the winners of the next decade.

The Need for Speed: Fast IT

Fast IT is the IT operating model for the IoE era. It is what the CIO needs to do to drive business transformation. It is an approach to IT that reduces overall complexity, increases service velocity, and does so with high security. Fast IT transforms and simplifies IT operations, making them more intelligent and secure (see Figure 1). Crucially, it melds this capability with the organizational changes needed to meet the accelerating demands of the lines of business (LoBs) — that is, sales, marketing, HR, finance, R&D, and so forth.

Figure 1. Three Pillars of Fast IT.

SIMPLE	SMART	SECURE
Simplify your infrastructure and integrate across silos	**Create** intelligent network capabilities and services that fuel growth	**Defend** against attacks and mitigate threats dynamically

Source: Cisco Consulting Services, 2014

The Fast IT study surveyed 1,400 IT leaders in a representative mix of industries in five key economies. This quantitative research was complemented by insights from key industry luminaries.

The Big Question:
How Can IT Accelerate Innovation?

To understand the extent to which IT organizations were helping bring about this transformation — fulfilling a strategic role of innovation enabler — and which factors, if any, were holding them back, Cisco undertook a multipronged research effort. We engaged Global Market Insite (GMI), a division of Lightspeed Research, to conduct a comprehensive global survey on the impacts of IoE on the IT function, and the extent to which the Fast IT capabilities outlined above have been addressed from both a strategic and an architectural standpoint. More than 1,400 senior IT leaders from a representative mix of vertical markets were interviewed in Brazil, Germany, India, the United Kingdom, and the United States.

This quantitative research was complemented by a program of in-depth interviews with IT luminaries — leading industry analysts, authors, academics, IT executives, and practitioners themselves — on how IT infrastructure, IT economics, and organizational dynamics are changing. We gratefully acknowledge the contributions to this research of Jaime Capella, managing director, Corporate Executive Board (CEB); Rebecca Jacoby, senior vice president and chief information officer, Cisco; Zeus Kerravala, principal analyst, ZK Research; Bob Laliberte, senior analyst, Enterprise Strategy Group (ESG); Steve Lucas, president, SAP Platform Solutions; Padmasree Warrior, chief technology and strategy officer, Cisco; Dr. George Westerman, research scientist, MIT Sloan Initiative on the Digital Economy; and J.B. Wood, president and CEO, Technology Services Industry Association.

Finally, we assimilated lessons learned from the dozens of engagements conducted by Cisco Consulting Services around the Internet of Everything. These three "lenses" gave us a comprehensive view of the state of IT organizations, their operations and infrastructure, their relationships with the business executives with whom they partner, and the changes needed to succeed in an IoE world.

Key Challenges for the CIO
IoE Is Supercharging IT Complexity – and IT Challenges

IoE represents the convergence of multiple technology transitions, including cloud, mobility, social media, analytics, security, and IoT. These create new opportunities, but also reveal new challenges. While there has always been a high level of complexity in IT, IoE is supercharging that complexity. We see this as business users bypass IT to utilize their own devices (BYOD), along with third-party services and applications (X as a service, BYOX), as part of the broader phenomenon of consumerization. Business users want to innovate, and they want to do it at a speed commensurate with the competitive pressures and demands for change they themselves face.

Our IT survey respondents are feeling the weight of increasing complexity: fully 80 percent see IoE as a "significant" or "very significant" challenge for their organizations. What this growing complexity implies, however, is that the effectiveness of conventional IT strategies and tactics is waning. IT cannot simply continue to add another server, or another full-time employee, to meet the scale requirements or service expectations of the IoE era. And it certainly cannot continue to do so in a manner that contains cost. As finance departments hold IT budgets flat (or worse, ratchet them down), the incremental expansion of IT resources and capacity is neither adequate nor practical.

At the same time, the relationship with IT suppliers is being upended, and IT service delivery models are unbundling, introducing basic questions concerning the role of the CIO and the IT organization. As J.B. Wood, president and CEO of the Technology Services Industry Association, and co-author of *B4B: How Technology and Big Data Are Reinventing the Customer-Supplier Relationship*, told us: "There's going to be a big reinvention, in my view, of 'who does what' in the value chain between the potential capabilities of a piece of technology and the business outcomes the customers want to get .... That's true at the infrastructure layer, and it's very true at the application layer."

Apps Are the Oxygen of the Business (but Can Smother IT)

The proliferation, criticality, and interdependence of applications are all dramatically increasing. And recent figures project app downloads will reach 138 billion worldwide in 2014 alone (Gartner, September 2013, http://gtnr.it/18meXDN). Applications are no longer fixed and premise-based. Now they are in the mobile cloud, and they need to be secure and accessible from anywhere, on any device. These factors are combining to intensify the complexity of IT in the IoE era.

Ensuring application health – whether in terms of availability, performance, security, or user experience – is an increasingly essential role for IT. Whether white-collar workers or blue, users expect flexibility, speed, and performance in applications that now act as the essential toolkit for how they do their jobs.

In this context, one of the greatest application challenges confronting IT organizations is provisioning enterprise applications at scale. Globally, respondents

Cloud, Big Data, and other drivers of IoE create opportunities for innovation, but their added complexity can hamper it.

For more insights, please visit:
http://cs.co/jbwood

"Shadow IT" is coming out of the shadows — in short, because users are not getting the business solutions they need from IT, or the experiences they prefer, in the time frame that makes a given capability valuable.

For more insights, please visit:
http://cs.co/blaliberte

For more insights, please visit:
http://cs.co/gwesterman

in our survey on average rated this issue a 7.5 out of 10 (where 10 represents a "very significant challenge"). In the Fast IT model, however, time required to provision an enterprise application can decrease from months to minutes ("click to implement"), allowing any IT organization to move at the speed of cloud. This zero-touch provisioning capability has huge implications for how companies leverage application functionality, and the rate at which innovations — new and better workflows, procedures, services, experiences, decisions — can be introduced.

Applications are also exerting direct impacts on IT infrastructure. In the IoE era, as Padmasree Warrior, chief technology and strategy officer for Cisco, observed in our interview, infrastructure needs to serve up functionality such as policy, quality of service, traffic prioritization, and so forth. Then, it must optimize all the resources to deliver against what the application needs within a particular business context.

A core part of this is what Warrior terms "application-centricity": the ability for an application to declare its requirements to the IT infrastructure and have the infrastructure respond dynamically with the appropriate storage, compute, or network resources, quality of service, security, and so forth.

As Bob Laliberte, senior analyst, Enterprise Strategy Group, told us, a paradigm shift is in order for provisioning applications. "In the past, it was that waterfall approach," he said, "where you started with an application demand that led to server requirements, that led to networking requirements, that led to storage — and everything was done serially. And it took a really long time to do that. Organizations are looking to automate as many of those manual processes as they can so they can reduce those time frames of the individual windows."

However, lack of IT capability to deploy and manage applications, and manage them rapidly, will stifle innovation and create a drag on agility. Moreover, if IT does not evolve, business users will look elsewhere for fast provisioning of the services and apps that they need.

Lines of Business Take IT into Their Own Hands

Cisco's research confirms that nearly half (46 percent) of total IT spending now occurs outside the confines of the "corporate IT" organization (see Figure 2). Our respondents know that so-called "shadow IT" expenditures — that portion of the 46 percent that occurs beyond the eyes of the IT organization — arise, in part, when the IT function does not meet business needs or deploy solutions fast enough, which they cited as the top drivers of shadow IT spending in the LoBs. But shadow IT is coming out of the shadows — in short, because users are not getting the business solutions they need from IT, or the experiences they prefer, in the time frame that makes a given capability valuable.

Banning shadow IT spending outright is futile and undesirable — futile because it is so widespread, and undesirable because it artificially hinders novel approaches and solutions. As Dr. George Westerman of the MIT Sloan Initiative on the Digital Economy told us in our interview, IT leaders should instead treat shadow IT spending and consumerization "as a signal."

Technology is not IT's problem alone, much in the same way that talent is not solely HR's responsibility.

Figure 2. IT Spending in Companies, by IT and non-IT Groups.
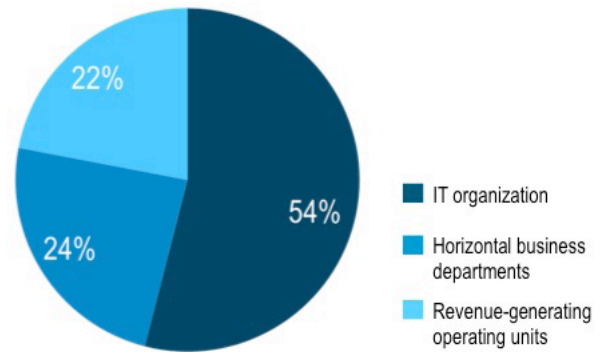
Q11. In some companies, not all IT spending is done by the IT organization itself.
What percentage of all the IT spending within your company is done by the following groups today?

N = 1,414

Source: Cisco Consulting Services/GMI, April 2014

For more insights, please visit:
http://cs.co/rjacoby

For more insights, please visit:
http://cs.co/jcapella

The growing prominence of IT consumerization, however, demands a new model for IT risk management. As Cisco CIO Rebecca Jacoby remarked, oftentimes the business "doesn't understand the risks it is actually taking." It is the role of IT to frame those risks such that the business grasps the nature and extent of risk associated with adopting a particular technology. Then, together, business and IT leaders can make informed decisions about how and where specific tools fit into their overall goals and strategies.

IT leaders need to be much closer to the business in terms of its priorities and future direction to drive and nurture a new level of engagement with business leaders. In the IoE era, every organization must think like a tech company. And as Jaime Capella of CEB put it, technology is not IT's problem alone, much in the same way that talent is not solely HR's responsibility. IT permeates all aspects of the business: Capella told us that in CEB's 2014 research across all functional areas (i.e., not just IT), three-quarters of the C-suite agenda now revolves, in some form or fashion, around technology. This is the context for a reimagined IT-LoB partnership in which innovation is a shared responsibility.

Service Orchestration Has Been CIOs' 'White Whale'

Back in March 2013, Cisco, in partnership with Intel, conducted a survey of IT leaders on the impacts of cloud on the IT consumption lifecycle. Respondents to that survey (http://bit.ly/1eA00KL) registered a clear consensus (76 percent) in the belief that IT organizations were evolving to be brokers, or "orchestrators," of services, applications, experiences, and new capabilities on behalf of the business. A year on, we asked respondents the same question. Today, the percentage that "somewhat" or "strongly" agrees stands at 90 percent (see Figure 3).

IT leaders understand the need to take on a service orchestrator role – but costly, unwieldy, and inadequately secured infrastructure is holding them back.

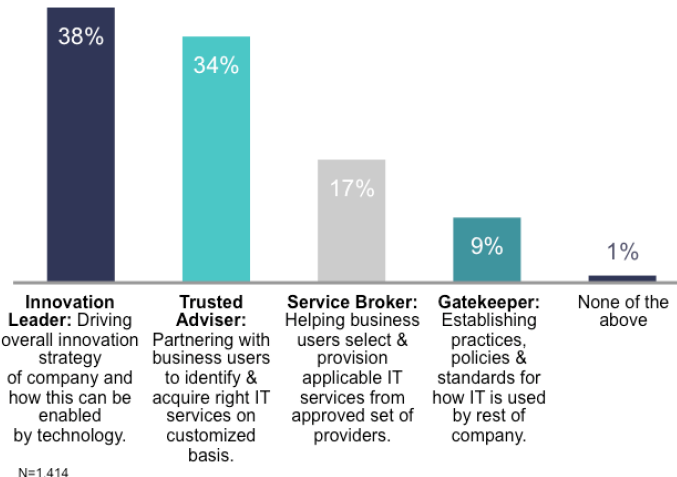**Figure 3.** Trend Toward a Service Orchestrator Model.
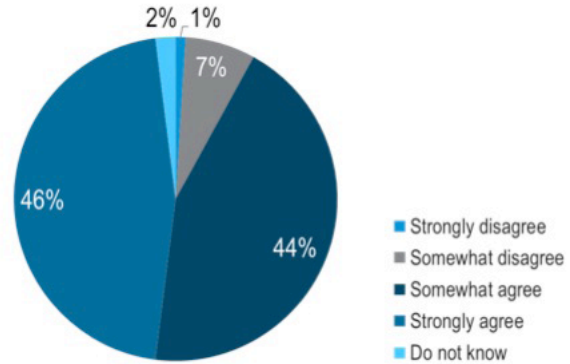
Q24. To what extent do you agree that IT organizations in general will evolve to a "service orchestrator" model? Select one.

N = 1,414

Source: Cisco Consulting Services/GMI, April 2014

In reality, CIOs have understood the need to reduce complexity and focus on business enablement for many years. But most still have a long way to go before they or their departments can be considered service orchestrators. The IT leaders in our latest survey conceded that the number-one area in which they are most falling short of expectations from the rest of the company is in driving business innovation. This is telling because business innovation is a primary output of good service orchestration. Interestingly, when we probed about which style of service orchestration would be most critical to their organization's future success, respondents pointed to higher-value roles focused on engagement and innovation. Such roles go beyond basic service brokerage (e.g., maintaining service catalogs, "strategic sourcing"), or serving as a gatekeeper of policies and standards (see Figure 4), although these are undeniably part of the equation.

Figure 4. Envisioning the Service Orchestrator Role.

| Innovation Leader: Driving overall innovation strategy of company and how this can be enabled by technology. | Trusted Adviser: Partnering with business users to identify & acquire right IT services on customized basis. | Service Broker: Helping business users select & provision applicable IT services from approved set of providers. | Gatekeeper: Establishing practices, policies & standards for how IT is used by rest of company. | None of the above |

N=1,414

Source: Cisco Consulting Services/GMI, April 2014

Without addressing fundamental complexity challenges, any effort to drive IT transformation will be a recipe for failure.
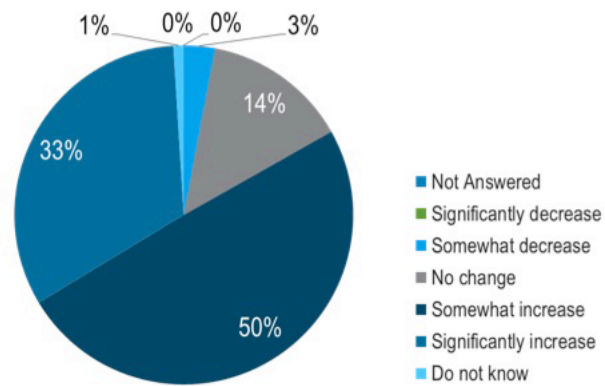
This begs a question: If IT leaders understand the need to shift to a service orchestrator model, why are they not making this transition? Why are IT organizations seemingly stuck in time, despite their best efforts? We contend that there is one principal reason IT organizations have failed to transform in this regard: because they are saddled with an IT infrastructure that is costly, unwieldy, and, above all, inflexible.

Fast IT: The Way Forward
IoE Demands a New IT Operating Model

Technology changes can support the evolution of the IT-LoB partnership in pivotal ways. A full 90 percent of our respondents agree that "agile" IT infrastructure models (defined for respondents as comprising key Fast IT concepts such as automation and programmability) are the way of the future (see Figure 5). Fifty-seven percent of respondents also saw an agile IT infrastructure model as "very important" to their organization's future. Another 37 percent called it "somewhat important."

However, Zeus Kerravala of ZK Research shared a fundamental problem of non-agile infrastructures. His firm's latest research indicates that IT shops now devote upwards of 80 percent of total IT spend to "keeping the lights on" (i.e., maintaining existing systems), with a worsening trend line in recent years. Many other industry researchers and analysts have pointed to similar numbers. This lock-up of IT spend pushes innovation to the margins of the IT portfolio, leaving precious little budget or human capital to drive better outcomes for the business.

For more insights, please visit:
http://cs.co/zkerravala

Figure 5. Change in Infrastructure Agility.

Legend:
- Not Answered
- Significantly decrease
- Somewhat decrease
- No change
- Somewhat increase
- Significantly increase
- Do not know

Pie chart values: 1%, 0%, 0%, 3%, 14%, 33%, 50%

Q45. How will the level of "agile" capabilities (i.e., automation, programmability, bridging of physical and virtual resources) in your company's IT infrastructure change over the next two years? Select one.

N = 1,414

Source: Cisco Consulting Services/GMI, April 2014

Without addressing fundamental complexity challenges, any effort to drive IT transformation today will be a recipe for failure. Padmasree Warrior of Cisco emphasized that "IT infrastructure in the future has to be much more programmable, automated, and orchestrated, and have the ability to tie both physical and virtual infrastructure together."

For more insights, please visit:
http://cs.co/pwarrior

This requires not just infrastructure convergence, but infrastructure unification. What is the difference?

Convergence implies bringing distinct media and services into a single infrastructure to share resources and interact with one another. When we converge voice and video infrastructure, or wired and wireless infrastructure, we allow for information integration and more seamless transmission and consumption. Infrastructure unification, by contrast, is about bridging IT domains (network, compute, storage, and security) to create a unified architecture and fabric so that orchestration of resources and task automation can be done across domains, and across physical and virtual assets. This enables a more holistic model for IT infrastructure management that can dramatically reduce costs and improve agility, resulting in lower TCO, faster provisioning, and greater innovation.

Fast IT addresses these issues head-on by moving infrastructure management up the stack and emphasizing a policy-based construct for IT architecture and lifecycle management. By using a policy "controller" model, IT organizations can begin to tap into perhaps the biggest value associated with software-defined infrastructure (whether network, storage, or compute): programmability. IT organizations need to stop coding IT infrastructure on an ad hoc, manual basis each time they want to take some sort of action for the business. This is labor-intensive, not scalable, and highly error-prone. IT instead needs a far more elastic architecture that emphasizes business rules and repeatability, combined with a system-level management model that provides improved end-to-end discoverability and visibility. This moves IT closer to what has been called a "single pane of glass" capability for managing and making proactive (rather than event-driven) changes to IT resources.

Next, we will drill down on some of the key technologies relevant to Fast IT — in particular, cloud, analytics, and security.

## A 'Fabric of Clouds' Provides the Platform for Change

Cloud is a key element of the Fast IT story. As our luminary interview subjects noted, the dominant model moving forward will be based on hybrid-cloud infrastructures, in effect a "fabric of clouds." This will include on-premise and off-premise, bare metal and hosted virtualization, private cloud combined with public cloud, with workloads and infrastructure tasks shifting as business (application) conditions warrant. Private cloud and public cloud, for example, each have their own economic, operational, and strategic appeal, and the best IT organizations will focus on capturing maximum value from both, leveraging an ecosystem of diverse cloud capabilities and service delivery partners. Most enterprises — and even small and medium-sized businesses — will operate an increasingly complex IT environment composed of many different consumption models and a multitude of outside vendors, spanning the entire IT stack. The key goal is to access the optimum cloud model for any business challenge, as it arises.

Respondents to Cisco's survey stressed, however, that their ability to derive value from cloud and new applications is currently hampered by the state of

> Private cloud and public cloud each have their own economic, operational, and strategic appeal, and the best IT organizations will focus on capturing maximum value from both.

their enterprise networks (see Figure 6), with more than two-thirds "strongly" or "somewhat" agreeing they are not realizing the full value of cloud.

Figure 6. Impact of Network on Ability to Garner Value from Cloud.

1%
5%
25%
42%
26%

- Strongly disagree
- Somewhat disagree
- Somewhat agree
- Strongly agree
- Do not know
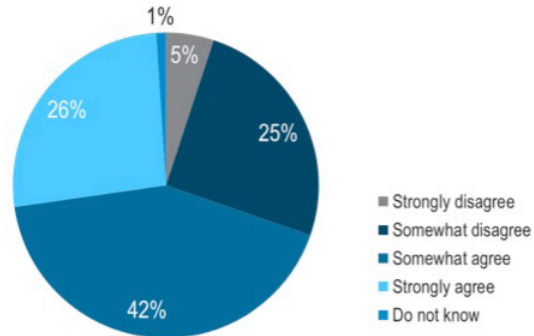
Q53.4. Please indicate the degree to which you agree or disagree with the following statements about your company's network environment and capabilities. My company is not getting the full value from cloud services and applications because they are run on a static network (i.e., a network that is not agile).

N = 1,414

Source: Cisco Consulting Services/GMI, April 2014

The ability to shift workloads throughout a hybrid cloud-based fabric of connections, while maintaining consistent policy, and ensuring regulatory compliance, confidentiality, and security, will underpin a new platform for service delivery enhancements, increased productivity, and business agility.

Those challenges will only increase as mobility and cloud dovetail in terms of how end users experience and consume IT services. With IoE "connecting the previously unconnected," new mobile-device form factors such as "wearables" and embedded sensor technologies will enter the mainstream. Consequently, we will see an upswing in demand for cloud-based applications, storage, processing, security, and more as user expectations and resource requirements outstrip the capabilities of individual devices.

The mobile cloud liberates users from ossified working arrangements. For IT, this means enabling collaboration, data sharing, and the provision of secure IT resources across a distributed, extensible architecture of devices, applications, and service entities. The ability to shift workloads throughout a hybrid cloud-based fabric of connections, while maintaining consistent policy, and ensuring regulatory compliance, confidentiality, and security, will underpin a new platform for service delivery enhancements, increased productivity, and business agility.

Fast IT is the model for managing through this cloud complexity, choosing the best option for a given circumstance, and then shifting workloads and provisioning capabilities at speed accordingly. As Rebecca Jacoby of Cisco states: "The core functionality is the ability to move the appropriate resource to the need in an automated fashion."

Intelligence 'at the Edge' Enables the Real-Time Business

All of those devices and sensors connected via the mobile cloud will be generating torrents of data. Which brings us to another key element of Fast IT — analytics.

Firms must leverage data when and where it is needed. The enterprise data warehouse has its place in IT strategy; but in today's environment, the all-too-

seductive "single source of truth" sometimes handcuffs IT organizations in driving innovation with deep business impacts. This is particularly true concerning their ability to leverage Big Data.

At Cisco we draw a distinction between "data at rest" and "data in motion." The former is the data that has been collected, backhauled to a data warehouse or the cloud, and is ready for use by business analysts. Data at rest, almost by definition, implies historical data because there is significant latency in the time it takes to capture, transmit, and analyze information across a number of hops in the network. "Data in motion" is the live, real-time information resident at the "edge" of the network — on mobile devices, in retail stores, on assembly lines, in clinical settings. Each has uses and value. Data at rest is particularly suited to insights based on patterns, correlation, and so forth, and to making forward-looking decisions about operations; data in motion is about capturing opportunities that are, by their very nature, fleeting.

Context-aware, real-time IT services will provide the next battleground for customer mindshare, and for employee productivity.

This is the new competitive frontier for firms in the IoE era. Data in motion gives rise to the potential for the business to deliver transformative processes, products, and services by truly operating in real time. By shifting some (not necessarily all) compute resources and analytics to the edge, embedding intelligence in network devices, and leveraging a "fog" computing approach (often in conjunction with a cloud architecture, as these need not be competing alternatives), the business can respond to events as they unfold.

With the Internet of Things (a network of physical objects accessed through the Internet; a subset of IoE), it is often much more efficient to process data locally (sometimes referred to as "intelligence at the edge") and transmit only the salient data. This saves on bandwidth and transmission costs, and paves the way for the combination of massively distributed architectures with advanced analytics that creates the possibility for "self-learning," thereby improving network security and performance.

Support for many low-powered and highly remote sensors that sporadically send data is a very different proposition for most IT shops. But the network is absolutely vital for wider business enablement as well because it drives transparency across the entire operation — even out at the end-user device, access point, or customer touchpoint. This facilitates another level of value-added decision-making — informing, for example, a brand marketer serving up an intelligent, location-based offer to a consumer contemplating an item in the store aisle, or a factory manager assessing whether to change production schedules. Context-aware, real-time IT services will provide the next battleground for customer mindshare, and for employee productivity.

This is enormously important, and not just from a network architecture standpoint. As Steve Lucas, president of SAP Platform Solutions, noted in our conversation on Fast IT, Big Data is perhaps the area in which IT can play the most central role in business innovation. Is an HR department, for example, going to harness terabytes of unstructured data (for example, video and social media) from the corporate network and company data stores, all without IT's involvement? Even if the HR team is fluent

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http://cs.co/slucas

in Hadoop, and uses their company credit cards to hire an "X as a service" vendor to crunch numbers or create analytical reports for them, it is likely IT will be called upon to enable this. In fact, IT enabling business-led innovation in this manner is healthy, and such a division of labor should be encouraged. As one instantiation of this concept, Lucas emphasized the notion of an analytics center of excellence to provide expertise, training, and scale where needed.

IT must be viewed as a go-to resource for the introduction of new, data-driven capabilities. If it is not (or worse, is deemed an impediment), this should be seen as a warning sign of a dysfunctional IT-LoB partnership, demanding attention at the senior-leadership level.

> With Fast IT, security evolves to a more platform-driven approach in which all infrastructure domains, devices, applications, and services are comingled and integrated through application programming interfaces (APIs) to enable greater intelligence, automation, and efficacy of threat detection.

In the IoE Era, the Security Perimeter Is Ever Expanding

Today, when a company experiences a serious security breach, it can generate the worst kind of headlines and erode customer loyalty — overnight. So, security is understandably a cornerstone of Fast IT.

The enterprise security model of the past 10 years has been marked by two chief tenets. First, security has been focused on best-of-breed applications and appliances: solutions for firewall, for network security, for data security, for content security, and so forth. Second, security has been "perimeter-based," meaning organizations secured the end device and the server, and reacted to (i.e., recognized) intrusions or threats such as viruses or denial-of-service attacks.

But when we connect the previously unconnected with IoE — by placing applications in the mobile cloud, by introducing new devices that enable innovative working modalities for employees, by leveraging sensors and machine-to-machine communications to monitor equipment — new points of ingress for security threats inevitably materialize. At Cisco, we sometimes refer to the expanding "attack surface" associated with all these new connections. As the two worlds of IT and operations technology (OT) intersect, there are many more opportunities for cross-contamination and new security vulnerabilities.

With the spread of new connected devices and the growing sophistication of attacks, these two strategies are less and less tenable. Best-of-breed solutions can no longer stand alone. And with so many devices, so many connections, and so much widely distributed information, there is no security perimeter. With Fast IT, security evolves to a more platform-driven approach in which all infrastructure domains, devices, applications, and services are comingled and integrated through application programming interfaces (APIs) to enable greater intelligence, automation, and efficacy of threat detection. A policy-driven, agile IT infrastructure can detect and quarantine cyberattacks before they can inflict grave harm — what we call automated threat detection. Analytics are a key element, offering the ability to assess the sensitivity or value of information to the organization, and to set security policy accordingly — dynamically.

As they consider their future IT strategies, security looms large in the minds of our survey respondents. Seventy-three percent of respondents expect security threats

to increase in severity over the next two years. Among top application challenges, the highest total of our respondents cited security threats (49 percent). Among top data-center challenges, security/privacy was also the leading factor, cited by 52 percent. Finally, a strong percentage of our respondents recognize the advantages of a platform-based Fast IT model for security — specifically, the ability of the network to detect and quarantine attacks before they can do great damage. In preparing for the increased connectedness of IoE, 67 percent see Fast IT as "very important," and another 30 percent call it "somewhat important."

IT Can't Afford To Be Seen as the 'Department of No'

IoE is not just about data and things. It is also about people and process. And Fast IT enables transformation in all aspects of the IT function.

IT organizations cannot profit fully from infrastructure change without effecting some necessary modifications to how the organization itself is run — especially if they are to take on an expanded role of partnering with the business and supporting innovation throughout the organization. Several of our IT industry luminaries identified culture and leadership as the most critical components of this change. They conceive of IT transformation as a journey, rather than a single-stage evolution, and view this challenge through the lens of change management.

> CIOs must lead by example, demonstrating a "service partner" mentality so that grassroots innovations can flourish.

In the same way that Fast IT involves bridging IT infrastructure domains, IT organizations also are conventionally organized around technology silos: the data-center people, the network people, the application people. (For example, consider how trouble tickets are issued to individual IT teams, each trained to provide a specific type of support to end users.) While this can be beneficial in terms of fostering expertise or promoting camaraderie among specialists ("birds of a feather flock together"), this tendency can also serve to constrict IT impacts. The preponderance and cultural acceptance of organizational stovepipes also need to change as IT assets and services become more dynamic and integrated. Indeed, as virtualization, multi-tenancy, cloud, and unified fabric models take root, those IT resources will increasingly serve multiple purposes.

From a change-management standpoint, this represents a substantial hill to climb, involving new roles and responsibilities, new performance metrics, and the need to acquire new skills (both technical and "soft," such as business acumen and collaboration) and to engage with the business in new ways.

How can IT leaders engage the business in new ways? Too often, IT is viewed as the "Department of No." This is not a desirable moniker. Most CIOs understand the need to evolve in this regard — but, at the same time, they must drive cultural change top-down. Zeus Kerravala of ZK Research summed up the state of IT culture this way: "Culturally, IT organizations often get stuck in these modes of, 'If it ain't broke, don't fix it,' or, 'This is the way we've always done things.' Frankly, those are very dangerous words. Technology doesn't stand still; nor should IT departments. The corporate leaders and the IT leaders need to facilitate a culture of change."

This need not imply a more authoritarian management model. Rather, CIOs must lead by example, demonstrating a "service partner" mentality so that grassroots innovations (that is, conceived by the "crowd," both employees and customers) can flourish. This requires consistently rewarding — and aligning key performance indicators around — collaboration, experimentation, innovation, and service delivery excellence, as well as communicating why such changes are instrumental to the organization's future development.

Capturing the 'IoE Dividend'

IT and the vendor community have already done what can only be described as a heroic job of lowering total cost of ownership (TCO) from historic levels. In recent years, a big part of TCO improvements has come via automation, outsourcing, and virtualization. Software-defined networking (SDN) is emerging as another area of potential gains, although technology maturity, standards, security, and overall understanding have acted as brakes on this.

The IoE dividend amounts to a doubling of the IT organization's contribution to the firm's overall "innovation capacity."

Now, another wave of TCO improvements is at hand. Cisco estimates a 20 to 25 percent improvement in IT costs as a result of Fast IT. These savings — what we call the "IoE dividend" — can be redeployed to address new business capabilities. As we have seen, companies currently devote less than 20 percent of total IT spending to transformation-oriented initiatives, with the vast majority of budgets allocated to maintaining existing systems. So, the savings from Fast IT amount to a doubling of the IT organization's contribution to the firm's overall "innovation capacity."

Our economic model for Fast IT, produced by Cisco Consulting Services, examined both Cisco's own experiences in deploying these infrastructure and organizational changes, as well as third-party data on company cost structures. The IoE dividend stems from multiple value drivers, including automation of IT tasks; lowering operating expenses and freeing up labor for more strategic projects; faster time to market of applications (and greater diversity of applications); faster provisioning of employees and ecosystem partners; higher application uptime; and reduced security breaches. Figure 7 illustrates how Fast IT can drive nearly $60 million in financial benefits for a typical company with $5 billion in annual revenue.

Figure 7. Estimated Financial Impacts of Fast IT for Company with $5B in Annual Revenue.
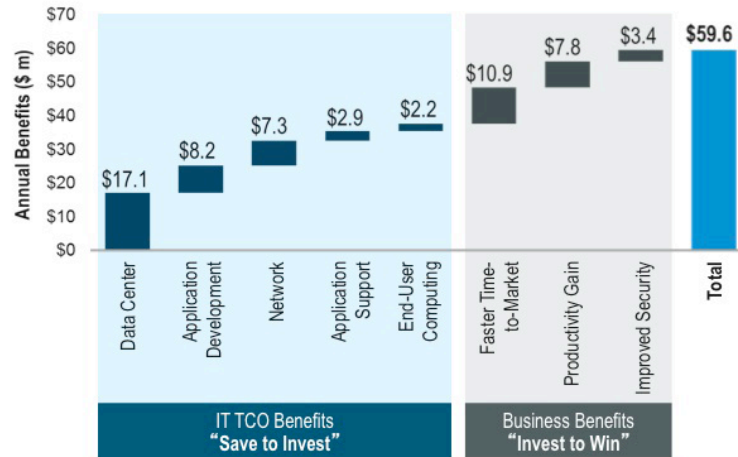
Source: Cisco Consulting Services, May 2014

The savings and freedom promised by Fast IT enable a shift in workforce priorities from "keeping the lights on" to aligning with LoB needs.

In the IoE era, the riskiest strategy is to discount change or to rest easy. An investment in Fast IT offers lower costs and faster innovation. Here is how the IoE dividend works:

Save to invest: Fast IT drives down IT infrastructure TCO by implementing agile capabilities; instead of "throwing bodies at the problem," Fast IT makes it possible to leverage cost savings to address skill gaps within the existing IT workforce.

Innovate to transform: As we have seen, IT is responding to a wide range of new demands from business users — at a time when IT budgets are flat. But the savings and freedom promised by Fast IT enable a shift in workforce priorities from "keeping the lights on" to aligning with LoB needs. IT can open innovation pathways and orchestrate services and new capabilities at speed. And it can leverage new flexibility in resources:

- To unbundle IT service delivery, enabling IT to embrace business outcomes and share accountability with LoBs
- To create new IoE-based experiences (for employees or customers) and foster disruptive business models (for example, a product manufacturer leveraging cloud to offer services)
- To use a share of the resulting new value (cost savings, revenue upside, market share gains) for reinvestment and increased shareholder value

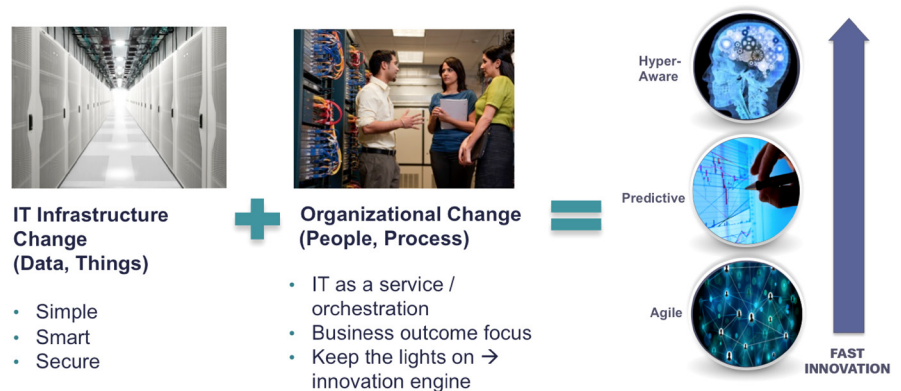## Fast IT: A Roadmap for Turning Disruption into Strategic Advantage

Earlier Cisco research (http://bit.ly/1cezlCz) and our ongoing conversations with customers on the topic of IoE reveal there are three essential attributes for an IoE-ready organization: it must be 1) hyper-aware, 2) predictive, and 3) agile. These are the traits the business will need to innovate faster and achieve its desired business outcomes, whether increasing market share, lowering customer acquisition costs, or reducing time to market. Mastery of the three "IoE-Ready" attributes will dictate who wins in the face of market disruption.

> IT organizations should not be tempted to create new software-defined silos that mimic today's "islands of infrastructure" and do little to address complexity, cost, or security.

Now, IT must respond. But where to begin? Most important, IT organizations must start by conceiving of IT infrastructure as a holistic pool of resources that can — and must — be marshaled for business gain. IT has made huge advances in server virtualization, and now we see greater demands for network virtualization in the form of SDN. But IT organizations should not be tempted to create new software-defined silos that mimic today's "islands of infrastructure" and do little to address complexity, cost, or security. Rather, they must embrace open-source frameworks to drive integration. And this is not "just" a data-center question; it impacts the wide-area network, access, mobility, security, storage, compute, applications, policy — IT infrastructure writ large — and the ability of that infrastructure (both physical and virtual) to serve up capabilities across all points in the network.

As we have seen, there is clear consensus among IT leaders and industry watchers that a new paradigm for infrastructure is at hand, one that supports IT in its future service orchestration role. But to deliver on its new mission — accelerating innovation for competitive success — IT needs to marry infrastructure change (data and things) with organizational change (people and process). CIOs cannot introduce a cloud service catalog and expect leaps in capability, or "reinvent" the IT-LoB partnership without architectural changes. These strategies must complement each other. And both are indispensable (see Figure 8).

Figure 8.   IT Transformation for Fast Innovation.

IT Infrastructure Change (Data, Things)
- Simple
- Smart
- Secure

Organizational Change (People, Process)
- IT as a service / orchestration
- Business outcome focus
- Keep the lights on → innovation engine

Hyper-Aware

Predictive

Agile

FAST INNOVATION

Source: Cisco Consulting Services, May 2014

The IT organization has never been more integral to the company's future, because innovating at the speed required by IoE depends upon IT's ability to deliver capabilities that can be deployed, scaled, and customized instantly.

To drive new organizational dynamics and business transformation, and to create an IT environment that is simple, smart, and secure, IT leaders must put in place several key infrastructure elements. These include:

- **Enabling programmability:** provides the foundation for application-centric operations, delivering intelligence and resources to applications as they need them, and creating new, customized experiences

- **Supporting automation and service orchestration:** brings a unified approach, with software-based programming and service orchestration functions across IT domains, and greater automation of management tasks

- **Creating contextual policy:** implements identity- and context-based (location, resource, access) policies across domains for simplified management and dynamic security

- **Harnessing intelligence:** makes infrastructure application-aware, with programmability that can respond dynamically to application requirements and deliver intelligence to applications for smarter services; implements tools for "intelligence at the edge" of the network and infrastructure analytics

- **Managing heterogeneous infrastructure holistically:** bridges physical/virtual, mobile/fixed resources across all IT domains, on-premise or off

- **Automating threat detection:** secures IT infrastructure and defends against threats before, during, and after attacks to manage risk and ensure business continuity

IoE presents enormous opportunities to companies that innovate quickly. More companies than ever now have the capacity to disrupt and win a huge share of markets, and to displace incumbents. As big as the opportunities are for fast innovators, the risks are as great for companies that are even a half-step slow. Market transitions are happening faster, and the winners are taking all. (According to Cisco analysis of company data from Thomson Reuters, 32 percent of the 500 largest firms ranked globally by revenue were displaced between 2001 and 2011. See http://bit.ly/1eA0m3N for more information.)

IoE value is indeed at stake — to be generated or not, won or lost. The IT organization has never been more integral to the company's future, because innovating at the speed required by IoE depends upon IT's ability to deliver capabilities that can be deployed, scaled, and customized instantly. Taking months to roll out new enterprise applications, or manually configuring the IT infrastructure to accommodate a new offering, are no longer options. Companies simply do not have the time to wait for innovation, or the money to spend on activities that do not yield it.

IT leaders understand this, and have been trying to transform their organizations from "order-takers" to service orchestrators that partner strategically with the business. But inflexible, manual-intensive IT infrastructure is standing in their way. As IoE continues to add more complexity to every company's IT infrastructure — more sensors, mobile devices, apps, cloud services — the percentage of time spent

"Organizations really need to be thinking about that next generation of innovative technology — the level of programmability, the level of automation and service orchestration — that's going to enable them to scale."

"keeping the lights on" will only increase, as will the "time to capability" delivered by the IT organization.

IoE changes the calculus of IT operations and refutes tried-and-true approaches for managing complexity in enterprise IT environments. As Bob Laliberte of ESG put it, with IoE, "there are not going to be enough thumbs to put in the dyke to hold back the 'water,' the deluge of information that is coming in and traversing the network. So organizations really need to be thinking about that next generation of innovative technology — the level of programmability, the level of automation and service orchestration — that's going to enable them to scale."

Fast IT delivers programmability, automation, and resource orchestration, accelerating innovation by reducing the complexity in IT infrastructure. By simplifying the IT environment and unshackling IT from its current burdens, Fast IT converts disruption from a challenge to a strategic advantage.

Acknowledgements

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