STANTON CHASE

The Internet of Things: Adapting Corporate Structure to Reflect the Connectivity of IoT

1. Introduction

The Internet of Things will allow organizations, governments, and individuals access to more data than at any other point in history. The implications of this phenomenal information increase are boundless, and we are just beginning to understand and imagine the possibilities.

"At its most fundamental level, what the Internet of Things provides is knowledge," explains Dr. Dennis Cronin, COO at Steel ORCA, a provider of global data center services. "Assuming we can prevent the corruption of that knowledge, we will experience the greatest commercial and cultural revolution of all-time."
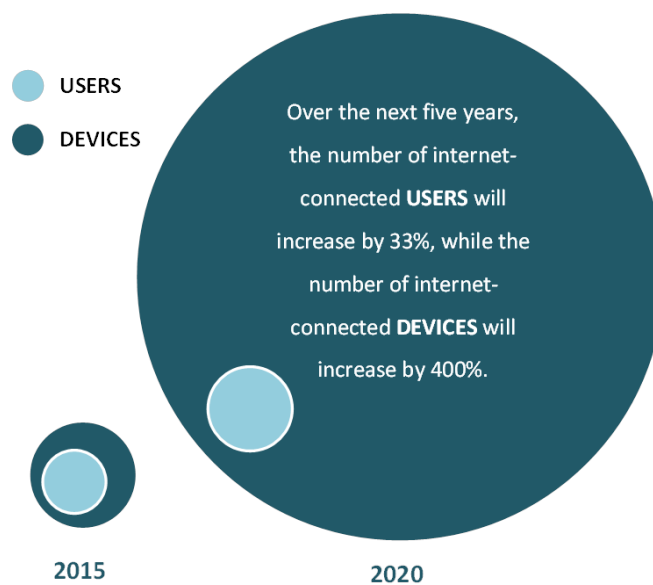
As the Internet of Things touches and transforms every facet of business, agile, innovative executives that work reciprocally across verticals will be crucial to an organization's success.

In order to evolve and develop a unique position in the marketplace, an organization's corporate structure must mirror the connectivity that the Internet of Things will allow amongst companies, clients, and consumers.

2. The Internet of Things Defined

The Internet of Things is the network of people and objects connected via the internet, each with their own unique identifier and capable of transmitting data over a network without direct human interaction.

The "internet" officially evolved into the "Internet of Things" once there were more devices connected to the internet than there were people. As of today, there are approximately 1.6 devices per user connected to the internet. That number will explode within the next five years: By 2020, the number of users connected to the internet is expected to increase 33% – to approximately 4 billion. Dwarfing that growth, however, is the number of devices connected to the Internet: An increase of 400% is expected, from 4.9 billion today to 25 billion in 2020. That equates to 6.25 devices per user.

USERS

DEVICES

Over the next five years, the number of internet-connected **USERS** will increase by 33%, while the number of internet-connected **DEVICES** will increase by 400%.

2015

2020

Simply put, the Internet of Things will pervade every aspect of first-world life, from wearable technology and smart home devices to advancements in environmental conservation and innovations in manufacturing, healthcare, and transportation.

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3. Why Now?

The Internet of Things is not new. The phrase was first coined in 1999 and the number of internet-connected devices surpassed the number of users in 2008. So why is the Internet of Things swiftly becoming omnipresent in business planning discussions across every industry?

Lee Congdon, CIO of Red Hat, the world's leading provider of open source solutions, recognizes the Internet of Things as an integral component of today's emerging business practices. "The Internet of Things is a central element of our burgeoning transition to an information-based economy," Congdon notes. "If past experience is a guide, the shift will occur more rapidly than some incumbents are able to adapt. The time to prepare for this extraordinary opportunity is now."

There are three main factors spurring today's pervasiveness of the Internet of Things:

IPv6: Creating Infinite Growth

On the most fundamental level, there is the long-awaited transition of internet address protocol. Each device on the Internet of Things must utilize a unique IP address as its identifier. 90% of devices connected to the internet today utilize the communications protocol IPv4. However, IPv4 addresses are finite in number and exhausted their maximum limit of 4.3 billion in 2011, spurring the official global launch of its successor protocol, IPv6, the following year. IPv6 can sustain 3.4 x 1038 devices, or 340 trillion trillion trillion – a seemingly infinite number.

Increase in Internet Protocol Addresses

IPv4	4,300,000,000
IPv6	340,000,000,000,000,000,000,000,000,000,000,000,000

Hardware: Increasingly Smaller and Decreasingly Expensive

The concept of the Internet of Things is a ubiquitous network, and a ubiquitous network will only be possible if the devices that comprise it are enabled with sensors that are increasingly smaller, lighter weight, more efficient, lower cost, and powered wirelessly.

Alex Osadinski, an investor, board member, and founder of several organizations, explains, "One of the biggest empowerments of the Internet of Things space is the shape and structure of the underlying hardware and software. There will be new challenges, and hence opportunities, derived from the highly heterogeneous nature of Internet of Things devices."

In recent years, sensors have become increasingly inexpensive to produce and incredibly small. This newfound flexibility is ushering in a massive period of great experimentation. Companies in every industry will have access to seemingly infinite new types of data. "This will be yet another reinvention of the internet," Osadinski continues. "We're likely to see the same frontier behavior, which will confuse, irritate and challenge us, and then provide us with new capabilities and applications that we haven't begun to imagine."

Smartphones and Wearable Technology: Internet Portability

The escalation of smartphone usage and the adoption of wearable technology have allowed the ubiquitousness required to power the Internet of Things. Worldwide smartphone usage has increased 45% in the last two years alone, and is anticipated to increase an additional threefold over the next five years, with 6 billion smartphones in use by 2020. Likewise, the number of applications available for download has nearly doubled in the last two years, with 10 million apps expected by 2020.

Expected Growth

Smartphones	Apps	Smartwatches
2020	2020	2020
2015	2015	2015
200%	567%	355%
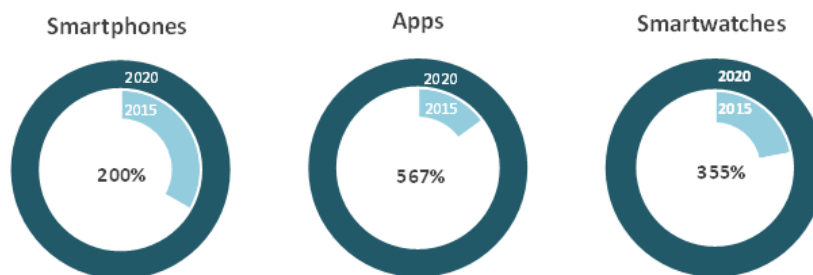
Poised for even greater growth is the wearable technology industry, covering everything from watches and fitness wristbands to smart glasses and sensor-imbedded socks. Wearables are expected to increase fivefold in the next five years, from 33 million today to over 150 million in 2020. Smartwatches, which currently account for one-third of the wearable technology market, will continue to dominate the industry with other devices carving out their own niches as wearables become more comfortable and more ingratiated into our daily routines and business processes.

4. The Internet of Things and the C-Suite

Data: Quantity and Quality

The Internet of Things will affect every function within every company within every industry.

It will make every business a data-driven business. Not only consumer-driven industries like advertising, healthcare, finance, and consumer products and services, but non-consumer businesses like industrial, logistics and transportation, and natural resources and energy. The Internet of Things will fuel a phenomenal increase in not just the amount of data we have access to, but the type of data.

Drew Fassett, CRO at leading data center provider, BYTEGRID, sees firsthand the importance of data collection and analysis in every industry. "To stay ahead of the technology curve, companies have to evolve into data-driven providers with real time analytics for not only internal metrics, but more importantly, to provide customers with value added insight and solutions."

Currently, data is collected in a conversational manner. A specific question is asked and answered. The Internet of Things will fundamentally change data collection from a conversation to an unspoken, never-ending stream of consciousness. Instead of data being collected by specific, pointed requests, the sensors embedded in everything from smartphones to banks to bridges will allow ongoing, omnipresent data collection. These devices remove human interaction and judgement from data collection, creating an immeasurable and unshaped mass of data.

Kevin Grundy, a founder of and executive at several companies, makes the following comparison: "The Internet of Things promises a new era wherein instead of inviting friends and contacts to follow your life via social media outlets such as Facebook and LinkedIn, commercial entities on the Internet will automatically track you throughout your daily adventures."

> By 2020, the total amount of data stored is expected to be 50 times larger than in 2015.

This influx of data will unquestionably change the way we do business, but it also holds the potential to change our business models, as well. The amount and type of data collected by the Internet of Things is an information evolution the likes of which we have never before seen, as structure will not be imposed on the data at the time of collection but rather after it has been collected, transported, and stored.

"One of the most important implications of the Internet of Things is the realization that massive amounts of information can be captured and harnessed to make more insightful decisions about behavior," foresees Sean Farney, Head of Global Technology Operations at Boston Consulting Group. This holds phenomenal potential for interpretation and identification of data trends that will create, expand, transform, and eliminate countless business functions. For C-suite executives and board members, this creates a unique set of challenges and opportunities.

Function-by-Function: Connectivity is Key

Although at its core, the Internet of Things is a technological evolution, it is fueling a business revolution. Leading an organization to evolve with the Internet of Things is not the responsibility of a single technology executive. Rather, it is an understanding, attitude, and adeptness that must be adopted within every executive role of the organization.

"In order to thrive in the Internet of Things landscape, organizations require greater talent with the skills to create algorithms and intelligence that will ultimately empower society to be that much better," says Caroline Tsay, VP/GM Online Business at Hewlett-Packard.

Chief Executive Officer

As the highest echelon of executive, the CEO has perhaps the most widespread responsibilities when it comes to the Internet of Things. The CEO must have an understanding of the organization's business model that is extensive enough to identify and comprehend how large amounts of contextually blank data can alter and improve the organization's competitive advantage. "The Internet of Things will continue to disrupt old value chains and service models," notes James McFadzean, North American Technology Practice Leader and Director at Stanton Chase. "Seizing the opportunity will be key to ensuring future competitive advantage in all industries." The CEO must recognize synergetic resources within the organization and ingrain a culture of experimentation, innovation, and reciprocity.

Chief Operating Officer

For the COO, the Internet of Things opens the door to limitless possibilities to reduce costs and improve efficiencies. More than ever before, Operations will have access to data from every facet of the internal organization as well as the customer experience. The biggest challenge for the COO will be to effectively communicate and implement these data-based cost saving initiatives throughout the organization.

Chief Technology Officer

The greatest strength of a CTO exploring the Internet of Things is innovation. As the CTO develops technology products and processes, there is phenomenal opportunity to differentiate the organization from competitors. Data collection will become cheap and commoditized; the true opportunity for defining an organization's uniqueness within the marketplace will come from the CTO's ability to see the potential for innovation that others do not. "The Internet of Things is forcing massive change on corporate IT," explains Sean Farney of Boston Consulting Group. "Those who identify, embrace, and empower their functional domains to react to this emergent trend will thrive. Those who do not, will disappear." A symbiotic relationship between the CTO and CMO offers the potential to strengthen an organization's competitive advantage.

Chief Information Officer

As the amount of data stored increases fiftyfold within the next five years, the CIO will have the greatest logistical challenge of any executive. The sheer magnitude of data to collect, transmit, store, and secure will necessitate organizational changes within every company. Sean Farney of Boston Consulting Group continues, "In the business realm, the rapid adoption of data analytics in strategy formation affects everything from operations to product development. The impact of this paradigm shift on a CIO's organization is significant and Darwinian: Change or be outsourced." The CIO will need to empower every function within the organization to embrace the concept of Big Data and incorporate its power and flexibility into every business process.

Chief Digital Officer

The most crucial dynamic that a successful CDO pioneers is integration of traditional business and digital strategies. The CDO acts as a conduit of sorts, designing, facilitating, and implementing cooperative initiatives between the CIO and CMO. The CDO must organize a cross-functional team that understands the implications that Big Data has on the organization's relationship with its customers and clients.

Chief Security Officer

The CSO will need a unique perspective when approaching data security, as there is no precedent for the volume of data available or the method in which it will be collected via the Internet of Things. "Each and every device presents an opportunity to both collect and lose data," explains Andre Turenne, Partner at D.E. Shaw Ventures. "This is the greatest risk of the Internet of Things, and one that must be mitigated to insure security for individuals, organizations, and governments." The number of third party vendors will explode to keep up with the need, many of which will lack the experience necessary to understand what data they are collecting and how to keep it secure. Vetting these vendors will be vital to an organization's success.

Chief Legal Officer

The CLO faces the most unpredictable scenario in the Internet of Things landscape, as there is little to no formal regulation on the privacy and limitations of data collected via Internet of Things devices. In one study done last year, more than half of the 100 most popular self-tracking apps in the iTunes Store were determined to not have a privacy policy of any kind, and those that did have privacy policies were inconsistent and vague. Another study conducted in the same timeframe revealed that 70% of the current Internet of Things devices transmitted at least some portion of their data over unencrypted networks. Until formal legal parameters are set and data is secured, this ambiguity has the potential to wreak havoc on the CLO's domain.

Chief Financial Officer

Bruce MacLean, CFO at Infomart Data Centers, already finds the Internet of Things to be integral in his daily management. "Our accounting, payroll, HR, phone systems – all of our administrative and financial functions are connected and supported via the Internet."

The CFO will need to adopt an offensive approach in order to keep finance and accounting information secure in the age of the Internet of Things. The data acquired via an organization's internet-enabled devices will be new, limitless, and contextually raw. Such a wealth of information has the potential to be reconfigured and mined for trends that offer insight into an organization's business activities, be it customer purchasing habits, production information, or shipping histories. The CFO will need to work closely with the CIO and CSO to insure the security not just of financial records, but of any data that could be used by an unscrupulous third party to gain an understanding of an organization's dealings.

Chief Marketing Officer

The CMO is wading into unchartered waters with the sheer magnitude and variation of data collected by the Internet of Things. Never before have companies had the opportunity to learn so much about their customers and clients, nor have they had the need to make their message so personalized. Amy Cielinski, VP Marketing at Canara, a firm that provides infrastructure monitoring and predictive analytics, understands the importance of data reliability and analysis in successful marketing strategies. "We foresee increasingly detailed visibility as the Internet of Things continues to penetrate data centers and critical power infrastructure systems. We will need to expand, extend, and integrate to translate the data to information and predictive perspectives for our customers."

However, with this increase in information and its consequential marketing implications, there is a concurrent need to reassure customers that their proprietary and personal data is secure and

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being used within the predetermined parameters that they have agreed to. Breaches in security are just as much a marketing problem as they are a legal one. The CMO will need to work in close conjunction with the CIO, CSO, and CLO to insure that an organization's marketing practices are safe, legal, and not exposing the company to litigious actions.

Chief Human Resources Officer

Much like the COO, the Internet of Things will empower the CHRO with a wealth of new information and capabilities to improve relationships and efficiencies. Using wearables to monitor and improve the health of an organization's employees could minimize sick leave and reduce health care costs. However, the CHRO will need to exercise the same level of caution as the CLO as formal legislation is put in place regarding the privacy of data collected via internet-enabled devices. At what point does this monitoring of employees' health extend beyond corporate policy and constitute an invasion of privacy? The CHRO will need to work closely with the internal communications team led by the CMO to communicate and institute these policies to employees.

**Interdependent Executive Relationships
Crucial to the Internet of Things Evolution**

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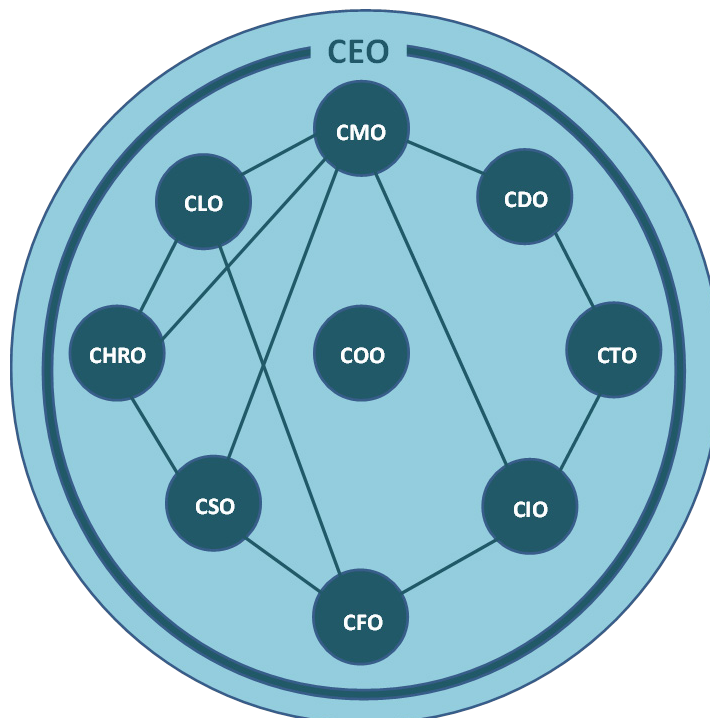
5. Conclusion

The Internet of Things ushers in an evolutionary time for business. Organizations will come to know more about their customers, clients, employees, and third party vendors than ever before. How this data is collected, secured, analyzed, and utilized to create a competitive advantage will be largely determined by the relationships of an organization's executives.

As the Internet of Things expands and stabilizes, every company will have access to vast amounts of data. The data is not what will empower an organization to be successful. Rather, innovation, communication, and reciprocity between executives and their teams will be the differentiating factors.

6. About Stanton Chase

Founded in 1990, Stanton Chase is your global leadership partner, recognized for exceptional results around the world.

With 350 consultants in 72 offices across 43 countries, Stanton Chase is unique in the executive search industry, offering clients the expertise and global reach of one of the world's ten largest executive search firms complemented by the service, industry expertise, and personal relationships usually reserved for small, boutique practices.

We welcome the opportunity to discuss how our firm can empower your organization.

For more information, please visit www.stantonchase.com or contact us:

James McFadzean

North America Technology Practice Leader
Director

j.mcfadzean@stantonchase.com

Jim, a 25-year veteran of the executive search industry, is based in the San Francisco office of Stanton Chase as a Director and serves as a member of the Global Technology Practice Group. He also leads the local Technology search consultancy team.

His distinguished career has included positions with leading international and boutique search firms where his assignments have spanned virtually all C-level positions, including boards of directors, engineering, operations, finance, sales, marketing, and legal. Jim has also spearheaded searches for start-up, emerging growth, and venture capital firms.

Prior to joining Stanton Chase, he was senior partner and founder of a local retained-search firm serving high technology companies. Jim also served as the U.S. Practice Leader for the Advanced Technology Practice for DHR International and as a partner with Ray & Berndtson and A.T. Kearney.

Andrew Lane

Managing Director
Milwaukee

a.lane@stantonchase.com

Andy brings 25 years of experience designing and fulfilling executive search strategies across diverse industries and markets, serving senior executives in both product and service based businesses from early stage to international F100 corporations. He has particular expertise in empowering high-growth businesses and divisions, emerging product and service initiatives, new ownership, and recently funded ventures.

Since 2007, Andy's practice has represented organizations that finance, design, construct, develop, own, and operate the world's internet infrastructure, including fiber and data centers. Andy has represented boards, private equity groups, and CEOs in a wide range of organizations, from entrepreneurial start-ups to multinational, publicly held companies, as they work to acquire uniquely qualified executive talent that increase business valuations in this fast-paced, rapidly growing market.

Andy has had the privilege of growing up with the industry and is immersed and recognized as a speaker, writer, and sponsor of industry events including 7×24 Exchange, Mission Critical Magazine, IMN, and DataCenter Dynamics. He is proud to call many industry leaders his friends.