How Service Providers Can Help Businesses to Realize the Promise of the IoT Revolution

We are embarking on a new technological journey that will fundamentally change forever the economy, society and the way that we live. Wired magazine described a new era where "the most mundane items in our lives can talk wirelessly among themselves, performing tasks on command, giving us data we've never had before." The Internet of Things (IoT) is a world where up to 50 billion things (or devices) will be connected to the Internet by 2020; or, the equivalent of 6 devices for every person on the planet.

The clear winners in this revolution will be those companies that, not only embrace the Internet of Things, but use it to transform their businesses. Those winning companies will be the ones that integrate IoT into their operations, products and customer interactions to create new business models and sources of value. In fact, McKinsey estimates that there could be as much as $11 trillion per year by 2025 in new economic value created by adopting IoT.

Businesses are beginning to completely re-design their processes, operations and business models to benefit from this new era. We are already starting to see the emergence of smart cities, connected utilities, connected railways, connected factories, connected cars, and even connected mines, to name but a few. All industries are looking to IoT as a breakthrough technology to help them optimize their business, enter new markets and enhance their relationship with their customers. This is why industry analysts, like IDC, estimate that businesses will spend up to $20 trillion over the next four years to realize the promise of the Internet of Things.

Companies like GE have connected sensors to their jet engines to provide near real-time monitoring of the health of their engines, reducing airline spending by 10-40%. In shifting from rules-based maintenance to more predictive driven intervention, GE has fundamentally shifted its business from one of selling jet engines to airlines to providing a comprehensive, engine-as-a-service offering. Using GPS and vehicle monitoring sensors, many utility companies are now able to more accurately monitor the performance of installation and repair personnel. General Motors uses sensors to monitor humidity to optimize painting; if the conditions are unfavorable, the work is routed to another part of the factory, thereby reducing repainting and maximizing plant uptime.

The oil and gas industry is probably one of the most advanced users of IoT technology with new production platforms containing more than 30,000 sensors, connected through a sophisticated central control and data management systems. IoT is also creeping into our everyday lives, with home security, thermostats and monitoring connected to data analytics, and all controlled through our smart phones. With an estimated 130 million consumers worldwide using fitness trackers today, the reality of more efficient, and personal effective health care is starting to become a reality.

In the future, all cities will be smart cities. With more than one-half of the world's population living in cities innovative new IoT solutions, such as smart parking, connected waste, and traffic management, hold great promise for combatting the major challenges of rapid urbanization. We are unlikely to see many Jetson-like smart cities of the future appearing overnight. However, like in the past with the adoption of revolutionary technologies such as sewers, electricity, traffic lights, and the Internet, mayors will slowly implement IoT solutions to save money, shape the future and make their cities better places to live.

The Internet of Things offers cities the unique opportunity to generate new revenue, save costs, improve efficiencies and increase the overall value and experience for its citizens. Solutions like smart lighting can greatly reduce a city's expenditure on electricity and operations, while at the same time improving the safety and security of the inhabitants. Smart parking not only allows people to spend less time in their car searching for an open parking spot, it actually creates new sources of revenue for the city. Parking can now be priced on a variable, demand-driven basis, rather than a fixed fee irrespective of the time of day. Such pricing flexibility allows rush-hour spots to generate much higher revenues than those available on a Sunday morning. Security cameras and traffic management solutions not only make citizens safer and save them time, but they allow police and emergency forces to be much more efficient and responsive to potential incidents.

There are some huge estimates of the value that will be created by the Internet of Things. While some of these optimistic values may never be realized, like at the dawn of the Dot-Com era, we know that IoT will not only add tremendous value, but will fundamentally change businesses, the economy and ultimately society. We are already witnessing companies capturing significant new benefits from implementing IoT in their businesses.

Realizing the Promise of IoT

The dawn of the IoT revolution may have begun but it will still be some time before its transformational powers will be fully felt. There are a number of technical, business, regulatory and perception obstacles that must first be overcome. We are still very much in the early days of the IoT revolution with many companies knowing that they need to do something but not sure, what or how. A study by Harvard Business Review and Verizon found that less than ten percent of enterprises had deployed IoT initiatives. And, of that small minority only 56 percent of those had an IoT strategy. What does that say for the 90 percent of companies who have yet to implement IoT initiatives?

Recent Cisco research of enterprise IT and business decision makers revealed that their top 3 challenges with implementing IoT initiatives in their businesses were: 1) security of business data; 2) standardization of IoT infrastructure and compatibility with business systems; and, 3) cost of implementation. The critical issues of security and data privacy are important elements that are being addresses, but we still have a long way to go to allay these justified fears around IoT implementations. Equally, there are organizations and committees that are working hard on establishing IoT standards to ensure compatibility between all of the different IoT components. However, the current

IoT technology and solutions environment is very much a Tower of Babel when it comes to interoperability and compatibility. The IoT supplier market is currently very fragmented with a multitude of big and small companies providing single pieces of the IoT implementation – devices, application, point solutions, different platforms, etc. Government regulation, will no doubt play an important part in the longer term shaping of security and privacy structures, driving standards and forming the legal framework for such leading-edge innovations as self-driving cars and autonomous machinery.

Telecom companies have realized that the IoT revolution holds for them the promise of new found revenues in connecting the projected 50 billion things. The number of cellular machine-to-machine connections grew 28 percent in 2014 and is estimated to reach to 1 billion connections annually by 2020. AT&T reported that it has more than 22 million IoT devices connected to its network. However, the vast majority of these devices will require very low bandwidth, as opposed to the demands of chatty and data hungry mobile users. Equally, most of these connections will be over unlicensed networks, like Wi-Fi, rather the lucrative cellular networks. As a result, the GSMA recently calculated that connecting things is two orders of magnitude less profitable than mobile broadband - $0.02 per month for things versus $20 per month for mobile users. Chasing value from connectivity effectively becomes a game of "trading mobile dollars for IoT pennies."

We believe that Service Providers are well positioned to unlock the true value of IoT for business and public sector customers. However, to support this assertion we believe that we need to answer a number of key questions:

- What are the key challenges that businesses have with IoT and how are SPs best positioned to help them?
- How can SPs add further value to their connectivity offerings?
- What are the best opportunities more value and move up the IoT delivery stack from connectivity?
- What are the potential economics and business models of these new solutions and services and how can SPs best extract value?

What Do Customers Want

The same Cisco end user research found that customers are not only looking to suppliers to provide them with end-to-end solutions but are looking for a broader array of services to help them successfully navigate this new technology revolution. Specifically, the top things that businesses are looking for from an IoT provider include: 1)

full solutions; 2) services (strategic planning, design, install, and technical support); 3) solutions that leverage existing infrastructure; and, 4) the ability to scale with organization's needs. Many businesses are looking for IoT as a managed service – designed, implemented and operated by someone else on behalf of the business. As part of that they are looking for "one throat to choke" – someone to take end-to-end accountability. It could be some time before a number of key IoT suppliers emerge from the current fragmented market to successfully address all of the businesses needs and help them to fully realize the promised benefits of the IoT revolution.

We are discovering that successful IoT implementations require a solid technical and business platform into which different vertical solutions can be easily plugged to efficiently and effectively achieve the promised business, economic and social benefits. The cornerstone of this IoT platform includes a robust connectivity and technology infrastructure, operational and management services, to accommodate a range of vertical and horizontal solutions (see Figure 1).

Figure 1.   Internet of Things Business Architecture
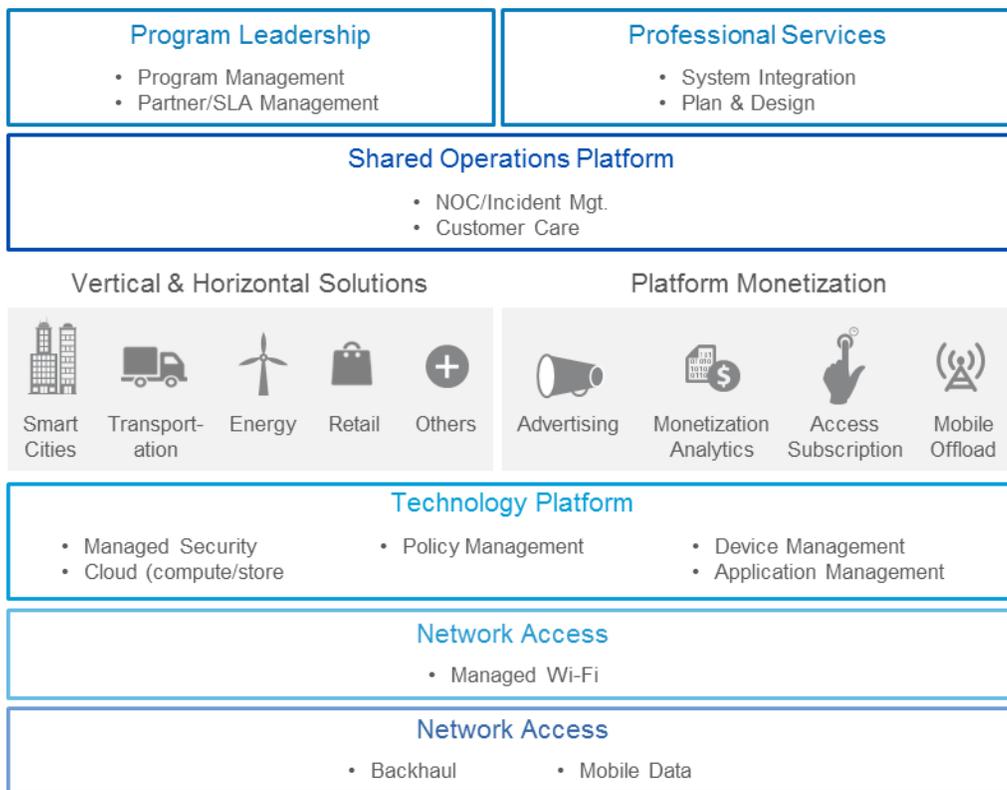
While network connectivity and managed access are essential elements of IoT implementations, we recognize three key areas for real value creation and realization:

1) Platform. We are seeing that successful IoT implementations require a comprehensive business and technical architecture – the IoT Platform – to provide the building blocks of the underlying infrastructure. This platform is comprised of 3 broad areas: 1) Technical – cloud storage and compute, security, etc.; 2) Data Management – capture, management, analytics, etc.; and 3) Management – policy, device, API and

application framework. These platforms are horizontal plays that can be leveraged across multiple verticals, allowing suppliers to reap the benefits of economies of scope and scale.

2) Solutions. Implementing effective IoT systems is complicated and often requires considerable customization. Providers who can provide end-to-end solutions (hardware, software, data insights, implementation and services) will be clear winners. Successful solutions have a vertical wrapper to make them relevant to the customer's particular needs. These solution providers will create new business models to deliver "IoT as-a-service" and outcomes-based financial models. For example, IoT-enabled machinery as a service, or payments based on energy savings will be new models that will reduce the risk to businesses and ensure successful IoT implementations. Providers who can successfully deliver solutions, vertical expertise and new business models will create deep and enduring relationships with their customers.

3) Business Integration. IoT is only as good as its successful implementation and adoption by the business. As we saw in the Internet revolution, there is a big need for outside providers to help companies to make this transition and to realize the promised benefits of the new technology. Key business integration needs include: 1) Business Consulting –identifying opportunities, creating the business case, re-engineering the business and change management; 2) Systems Integration – integrating IoT systems with existing systems, data and processes; 3) Management – program management, ongoing operations and outsourcing of key operations.

An Ideal Role for Service Providers

Given commoditization in connectivity and the shift to value-added areas we estimate that the solutions area will comprise only 30% of the revenue opportunity for IoT vendors, followed by 15 % for each of the platform and business integration layers. Equally, unlike core connectivity, much of this revenue will shift to repeatable revenues from managed services, based on the delivery of realized business outcomes.

Service providers are well positioned to lead the development, implementation and operation of the IoT platform and initiatives. In fact, we believe that they are one of the few groups of vendors that are capable of meeting all of businesses technical and their customer needs to ensure successful IoT implementations. They have years of experience building and running networks, operations and customer service. Many SPs now offer extensive global cloud capabilities and data analytic and insight services. In addition, SPs often have in-house systems integration services or partnerships that allow them to knit together complex solutions. SPs have strong brands, which not only ensure delivery but also trust – of critical importance in an IoT world. Equally important is the fact that SPs have well established vertical sales organizations and solutions focused on addressing the needs of enterprises and public sector customers.

We are starting to see SPs around the world beginning to align this wealth of assets and capabilities to service the IoT needs of their customers. However, many still remain focused on their core business of providing network

connectivity. The big opportunity exists to move up the IoT platform stack to build and deliver new sources of value. SPs should consider following the four phases to building an IoT business outlined in Figure 2. Of course they should be providing wired and cellular connectivity in Phase 1, but should also seek to add more value by creating and managing wired, Wi-Fi and other networks, and providing connectivity management to support IoT implementations. The second phase should start by expanding beyond connectivity to the closely aligned areas of delivering the technology platform. SPs can leverage and expand their existing capabilities to provide security, cloud services, data management and analytics, and policy, device and application management. Phase 3 involves creating new businesses around solutions by building off existing capabilities, seeking partners or considering select acquisitions. This phase involves not just somewhat risky investments in creating new IoT applications and solutions, but creating the vertical expertise and go-to-market capabilities to respond to customers' business needs to provide winning solutions in the marketplace. Most likely, this will involve partnering with leading IoT vendors to quickly deliver successful solutions. Lastly, some services providers could consider providing the end-to-end leadership of complex IoT solutions (Phase 4). This includes program management, systems integration and operating all aspects of the implementation. While some SPs are well positioned with SI and business consulting capabilities of their own, many others will be challenged to address this phase and will need to seek strong partners to make it a reality.

Figure 2. The Phases of Building an IoT Business
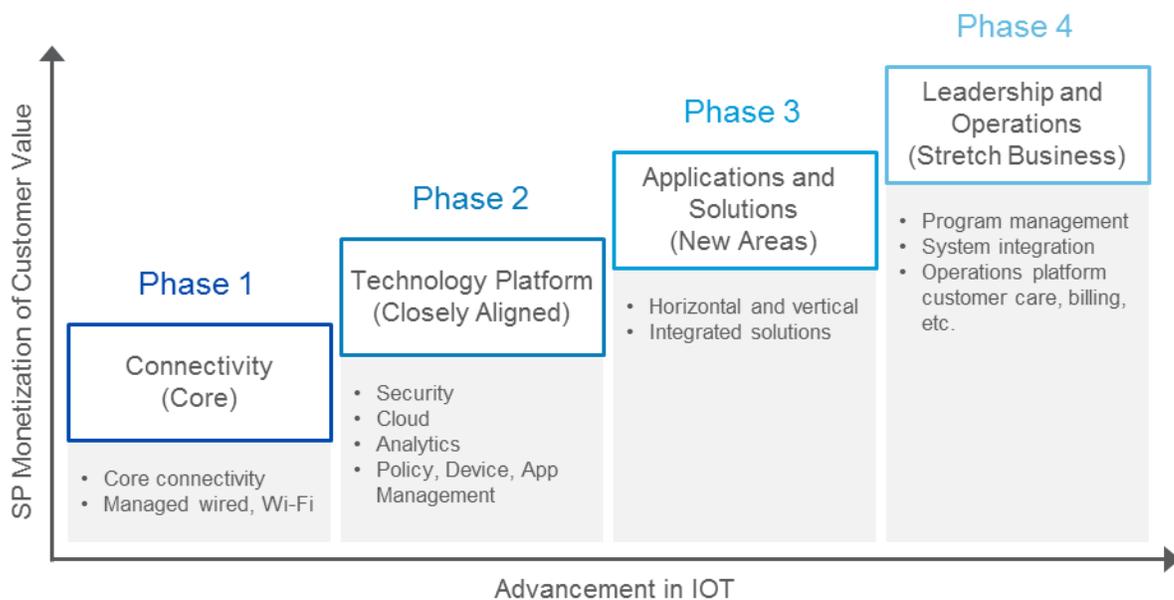
To realize these goals and profit from the enormous opportunity that the IoT revolution has to offer, SPs need to develop a strategy and plan for where they want to play and how they can best capture value. They need to closely assess their business and decide which of the IoT segments is core, closely aligned, new areas or a true stretch. Using this analysis they can decide where they want to play, both now and for the longer term.

While SPs are very well positioned to service the IoT revolution, this new business is very different than the traditional telecommunications business. Operators will need to develop new business models, much beyond the traditional fee for service model. The IoT world will be dominated by managed service models where businesses pay a recurring fee for the development, implementation and ongoing operations of their IoT services. Closely

associated with this model will be performance-based models and service level agreements which appropriately penalize or reward the outcomes of the managed IoT services. As we have seen the IoT world is complex with many technical, operational and business components offered by a slew of specialized and expert vendors. SPs will not be able to go it alone. They will need to develop their own vertical and technical skills and establish key partnerships and manage a robust business ecosystem to bring the best outcomes to their customers. Equally, SPs will need to leverage and carefully manage this ecosystem from a go-to-market perspective to maximize sales opportunities and customer interactions and minimize channel and customer conflicts. Lastly, given the pace at which the IoT revolution is unfolding it is essential that SPs have organizational and operational speed and flexibility to meet the unknown needs and opportunities ahead.

Creating an IoT-focused organization is critical to capturing the new value from the IoT revolution. In order to achieve this goal SPs will need to develop a host of new capabilities, create new sources of expertise and undertake a number of tangible actions to make this transition a reality. Our accompanying white paper "Evolution to a Next Generation IoT Services Provider" explores in much more detail the actions that SPs need to undertake to create an IoT-focused organization.

Creating an IoT-focused organization, through leveraging existing capabilities, building new ones and transforming the organization, is one thing. However, the real measure of success will be in convincing customers that SPs are the ones to lead them through their IoT transformation. SPs will need to demonstrate the business value through solid business cases and proven customer examples. They will need to not only promise customers the highest level of security and reliability, but commit to it through enforceable service level agreements. SPs must bring to bear the full range of their capabilities to service their customers' needs, and ultimately, provide the integrated, "one throat to choke" that most customers desire to ensure that there IoT transformation is successful.

Delivering the IoT Revolution

Helping to deliver the IoT revolution presents huge opportunities for business and technology suppliers. The winners will be those companies that bring distinctive technologies, innovation, new business models and deep industry knowledge to the three key areas of IoT value creation. Service providers are well placed to take a leadership role as the providers of the IoT revolution. But, they better act fast to stake out their dominant role in the four phase IoT value chain. Technology vendors, services companies, start-ups and niche players are all circling the waters to see how they can grab a piece of this tantalizing $20 trillion business. SPs need to move fast to establish this key leadership position before the window of opportunity closes. If they fail to grasp this opportunity now they will be resigned to the connectivity business like in the previous broadband and mobile technology revolutions.

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