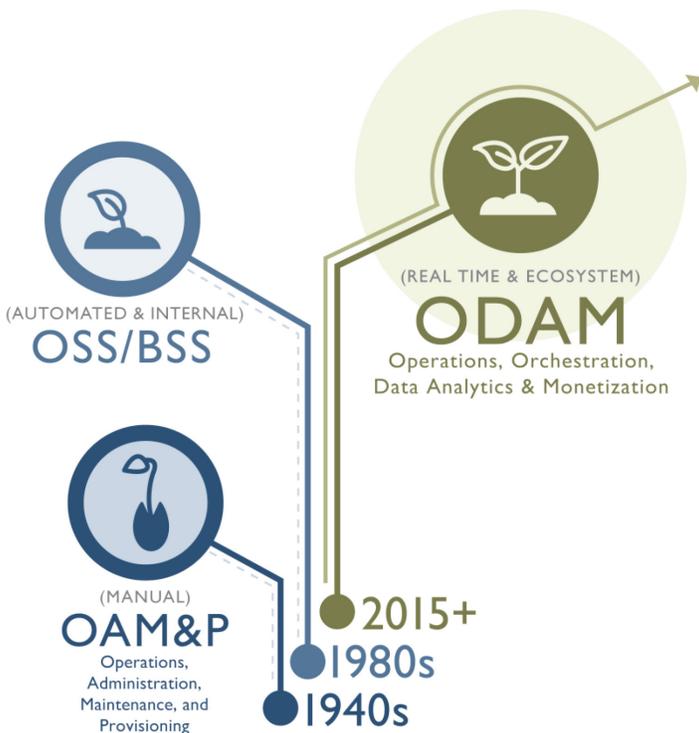


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Driving Profitability in the Connected Economy

How Real-Time B2B2X Billing Enables the IoT Marketplace

Stratecast Analysis by
Karl Whitelock



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Introduction¹

Before the days of talking toothbrushes, before cars provided access to the Internet, and before “booking a room” meant asking strangers to rent you part of their home, communication service providers (CSPs) sold just network services—mobile voice, data and text messaging, along with fixed-line voice and Web access. What made CSP services appealing was the single source of supply and usage-based measures for calculating a bill. Minutes of use for voice, mobile text messages sent, or data access volumes, counted against a pre-paid or subscribed level of spend.

As recently as four years ago, usage-based billing² was the primary means CSPs used to charge for all communication service bundles. Usage-based billing is still the prevailing way in which network-based services are charged, although more complex models are now coming into play. For the rest of the world’s industries, from manufacturing to financial services and from government to agriculture, a subscription billing model³ is the dominant means for monetizing digital services today.



¹ In preparing this report, Stratecast conducted interviews with the following representatives:

- LogiSense – Flavio Gomes, Founder and CEO
- LogiSense – Ricki Gill, Director of Marketing and Product Management

Please note that the insights and opinions expressed in this assessment are those of Stratecast, and have been developed through the Stratecast research and analysis process. These expressed insights and opinions do not necessarily reflect the views of the company executives interviewed.

² Usage-based billing refers to a measure of consumption multiplied by a general rate per unit, and then discounted as applicable, to define a billable amount. For CSP services, measurable usage-based units include voice minutes, text messages sent or received, and data volume (megabytes) consumed. For virtual data services, the measurable billing unit is more complex. It can be represented as CPUs utilized, level of data stored, online memory used, or data accessed (input/output). Additional insight concerning virtual service usage measures can be found in Stratecast report SPIE 2015-01 [Cloud as Commodity: UCX Trades Cloud Capacity on the Chicago Mercantile Exchange](#), January 9, 2015, pp 4-5.

³ Subscription-based billing, also called recurring billing, has its place with retail commerce. Examples are a monthly software service or annual magazine subscription. The customer pays for a set period of time, according to terms. The service automatically renews for the next period, and the next, until cancelled.

Real-time usage-based billing is a new concept for most industries. However, today's connected economy is about real time. Real-time access to any type of data service, real-time access to mobile apps, real-time interaction with different “devices and things,” and real-time delivery of all forms of content—video streaming, surfing the Web, and on-line gaming, for example. CSPs engage with real-time monetization tools that take advantage of network usage measurements, to offer bundled service packages that now involve network and partner-provided interaction. Real-time purpose-built analytical tools help CSPs understand customer usage behavior; the results of which can be aligned to trigger new service offerings in real time when usage conditions dictate.⁴

Real-time, policy-enabled rating & charging,⁵ combined with self-service customer care, are the key components that make real-time CSP service offerings a business reality. For all other industries that incorporate communications services into the goods (and services) they provide, real-time monetization means real-time accountability of the revenue flow between customers and partners. Within today's increasingly complex B2B2X ecosystem of providers, customers, and partners, real-time monetization enables business opportunities not previously possible.

For those that can visualize how a usage component added to a subscription-based billing service can augment a “plain vanilla” customer offering, new revenue opportunities abound. For example, HP offers its [HP Instant Ink](#) service for select HP printers. The service provides consumers with a continuous supply of ink, ordered by the printer when its supply gets low, and then delivered to the consumer's location. The HP Instant Ink service is based on the number of pages printed per month. There are three options: 50-pages per month, 100-pages per month and 300-pages per month, which can be subscribed at \$3.99, \$5.99 or \$10.99 per month, respectively. There is no obligation or commitment beyond the first month of the service. Such a real-time usage-based subscription plan is a key differentiator for HP in the crowded personal printer market.

This week's SPIE identifies the monetization complexities of multiple partner relationships that now characterize the “everything connected” business environment. The report explains how an ecosystem of partners can be remunerated for their machine-to-machine (M2M) and Internet of Things (IoT)⁶ solution contributions, based on IoT solution usage. The report also shows how one real-time billing solution supplier—LogiSense—manages the monetization flows from complex B2B2X relationships associated with a multi-layer ecosystem of IoT solution partners.

⁴ For a deeper definition and example of purpose-built analytics designed to improve the customer experience, while generating new CSP revenue streams, see Stratecast report OSSCS 16-05 [Purpose-Built Analytics Advances the Personalization Experience While Capturing New Revenue](#), June 2015, pp 15-20.

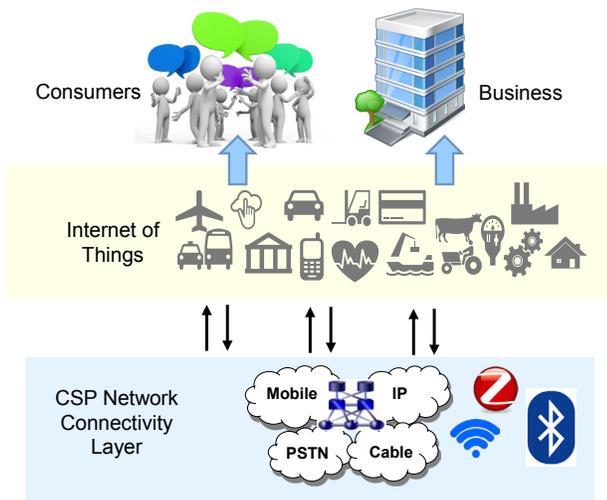
⁵ Rating & charging is the assignment of monetary value to customer usage of a CSP's assets and partner-provided content or services. Policy management allows the tight control of when a transaction is charged (or not) depending on business and customer usage conditions. The global rating & charging solution supplier market generates several billion dollars annually, while the policy management market generates more than a billion dollars more. For more insight see Stratecast report OSSCS 16-08 [Global CSP Billing 2015 Edition Part 3: Rating & Charging and Other Core Billing Market Forecast and Market Share Analysis](#), July 2015; and Stratecast report OSSCS 16-09 [Global CSP Billing 2015 Edition Part 4: Policy Management Market Forecast and Market Share Analysis](#), September 2015.

⁶ M2M has historically referred to the collection and remote processing of data from sensors and devices, such as flow meters, pressure valves, and distance monitors. IoT has more recently referred to solutions tied to the consumer market, such as fitness tracking wearables or remote patient monitors. While some try to draw a distinction, many continue to refer to M2M and IoT interchangeably. For this report, Stratecast uses IoT to represent both terms.

Complexity Abounds within the Global Connected Marketplace

The volume of connected devices, beyond just smartphones, is exponentially rising. Many see the business opportunity for “IoT-based everything” as consisting of a network connection⁷ and customer device interaction. In support of this simplified customer view, examples abound from connected cars, healthcare, manufacturing, energy & utilities, transportation logistics, and retail. However, as with just about everything in life, nothing is as simple as it seems.

When addressing the needs associated with our quickly evolving, everything-connected society, a look behind the scenes reveals growing complexity. The market is filling up with IoT platform providers, including platform announcements in 2015 from Cisco, Hewlett Packard Enterprise,



Huawei, IBM, Microsoft, and SAP. Other suppliers building market momentum, such as Accenture, Amdocs, Ericsson, goTransverse, Intel, Oracle, Qualcomm, and Texas Instruments, have been involved with IoT solutions for at least the past 2-3 years. A sampling of still other IoT suppliers that have worked the IoT market for a much longer time include: Aeris, Jasper Technologies, Kore Telematics, LogiSense, Numerex, PTC (Axeda and ThingWorx), and Wyless. Each of these organizations is finding the IoT market commercially rewarding. Some companies, such as GE, have even dedicated their total business strategy to the delivery of M2M and IoT solutions.

Delivering customer value, and reaping the monetary benefits from providing solutions to the global IoT marketplace, requires partner-level orchestration and management. This means that each listed supplier, and the many others that were not mentioned as claiming to have an IoT solution role, must “live up” to the definition of IoT Solution Provider. In this role, partnerships are essential for any organization to manage all B2B transactions, and to address all functions relative to the application layer, device management layer, and connectivity layers, shown below in Figure 1.

An IoT Solution Supplier bundles the multiple layers of commoditized partner-provided capabilities to create solutions that address a given customer’s needs. Examples include: patient data facilitation for healthcare; point of sale solutions for retail; and location tracking for the heavy equipment, long-haul transportation, and shipping logistics sectors. These are the tip of the iceberg, however, as IoT solutions continue to come online within all of the industries that now dot the global landscape.

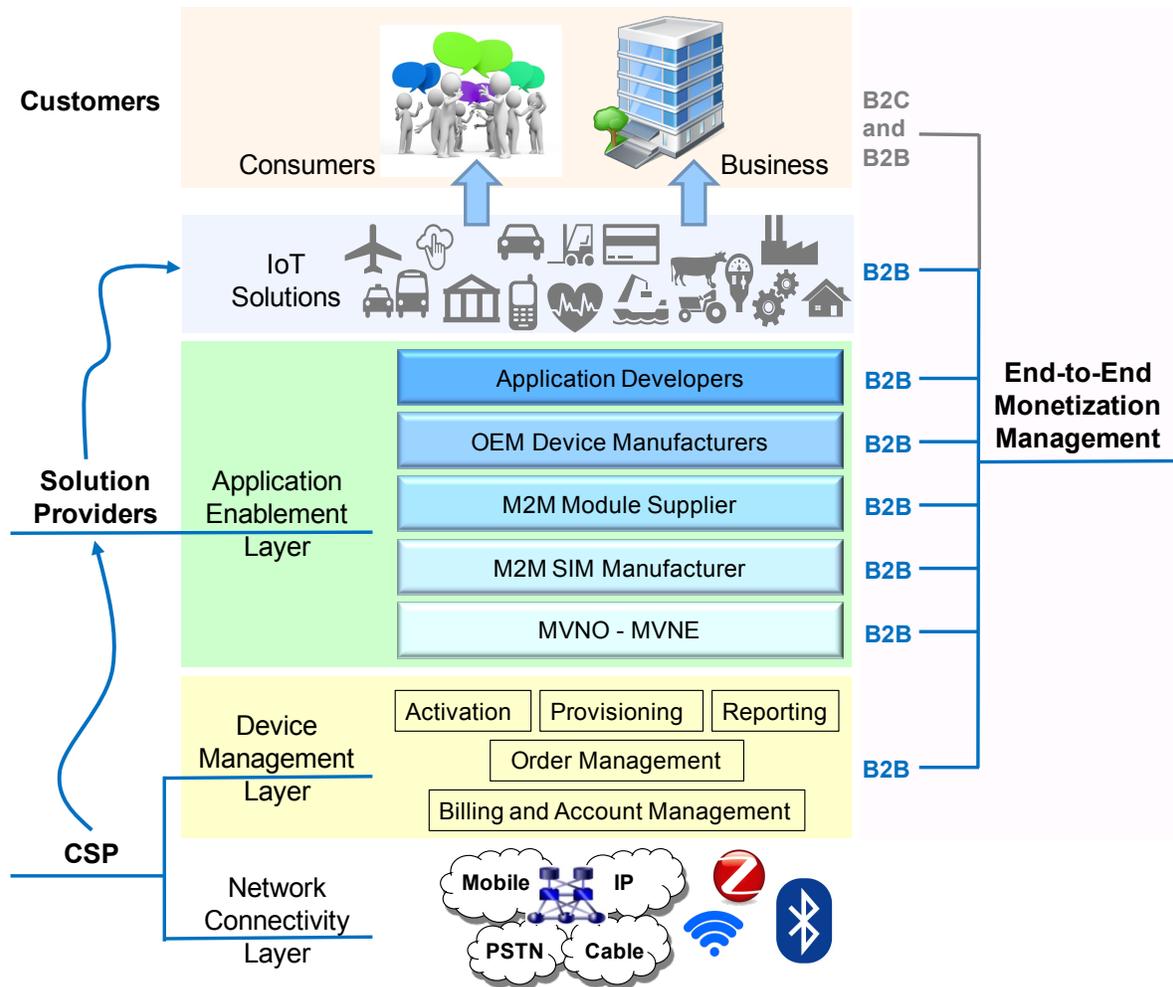
Figure 1 also lays out a taxonomy of the operational layers that an IoT Solution Provider brings together when enabling “customer ready” IoT solutions. They are:

- **Application Enablement Layer** – Addresses the common IoT functions, and administers the flow of information through application programming interfaces (APIs) between a device and the applications that ultimately deliver value to the end customer. This layer includes a business monetization definition component.

⁷ Connectivity directly to 3G or 4G cellular or to the Internet via Wi-Fi, ZigBee, Bluetooth or some other means. Most consumers expect a connected device, outside of a smartphone or tablet, to “work” without a data usage fee.

- Device Management Layer** – Contains a network operator’s IoT service enablement capabilities, and specifically addresses the operations and monetization functions pertaining to an IoT-enabled service. The platform is responsible for: service and device provisioning on a carrier’s network; revenue management calculations and partner compensation tallies; device administration; device status reporting; and usage pattern analysis.

Figure 1: Monetization Flow for IoT-Based B2B2X Partner Ecosystem Solutions



Source: Stratecast

- Network Connectivity Layer** – Provides network connectivity as part of the IoT service provisioning and activation step. This is done through the associated carrier’s network, as defined by the embedded SIM. Connectivity is supplied in a number of ways—for example, in the mobile domain through a cellular network, Wi-Fi network, satellite network, and, eventually, any combination of these networks, as technology evolves. This layer includes a business monetization definition component.

Many of the suppliers named in this report, and all others not previously mentioned, do not always address the functions described within these three IoT solution layers. However, the functions in each layer are essential for IoT operations to successfully meet customer hopes and to satisfy partner

expectations. **The most commonly overlooked business function within these three solution layers is the detailed tracking of revenue from customers (B2C) and the correct accountability (including allocation of revenue) for the contributions each partner (B2B) makes to an end-to-end solution.**

Monetizing the Connected Economy: A Critical Business Challenge

Without question, the IoT market is in its early stages of delivering customer value; yet, the push ahead is happening at an accelerated pace. Why? Opportunity abounds for CSPs to augment declining voice, text, and even mobile data revenue with new IoT business solutions. Yet, operating costs associated with their core business continue to escalate, which is exacerbated by mobile technology upgrades to 4G LTE.

Applying a focus on the new opportunities that IoT brings is not only taxing on existing budgets, but clearly pushes CSPs into an already crowded market with installed operations and monetization systems that were never designed to address the requirements that the IoT world brings. Nevertheless, gaining a profitable means to provide IoT business solutions, whether by a CSP directly or in partnership with other IoT Solution Provider organizations, can be effectively defined around three key management control points:

- **Operational Cost Containment and Margin Maximization** – Cost control within the IoT market is critical. For example, CSP revenue from human-focused mobile network services can exceed \$60 per consumer per month in North America⁸ and somewhat less in Western Europe. For an IoT solution, many now describe the average revenue per device (ARPD) at \$1 - \$2 per month. While the cost side of CSP operations is more difficult to define, constant expenditures to improve mobile coverage, or upgrades to more advanced network technologies, requires sizeable budgets. In addition, support functions such as the customer care center add additional cost from a human resource perspective. On the other hand, IoT solutions are ripe for maximized levels of automation and even a major reduction in the need for certain business support functions such as customer care, if the right levels of automation are available.

Because IoT solutions need new systems and process investment, cost reduction can be a driving factor in pushing automation wherever possible. Coupled with the level of revenue collected per touch point for an IoT solution versus traditional human-focused network services, IoT solution margins will only stay positive through operations automation.

- **Business Models for Long-Term Growth** – In addition to very low ARPD values, IoT devices, excluding smartphones and tablets, use network resources differently. The payload side is disproportionate to the underlying signaling side of a network connection. A similar concern exists with encryption, where data encryption may require more payload than the data that is transmitted.

Comparing human-based network usage with IoT device connectivity, there is typically a larger number of network connect and disconnect requests for an IoT solution due to the number of devices involved and the number of times each device connects to the network,

⁸ Average revenue per user (consumer) in North America at the end of 2014 was \$59.66 per month. See Stratecast report, CCS 9-6 [North America Residential Wireless Tracker: 4Q14, North America](#), March, 2015.

often on a scheduled basis. This difference means that network operators and solution suppliers should look at business models and pricing plans for IoT solutions differently than for traditional services—such as pricing based on the number of times a device registers and connects with a network rather than the traditional approach based on payload volume.

As the number of smart devices proliferates into the billions, enterprises will incorporate more and more IoT solutions into their business strategies. This action will make ARPD drop to even lower values. Low ARPD means business solutions grow more profitable for a CSP and IoT Solution Provider, not by the volume of data transported across a network, but by the number of devices engaged by an IoT solution. For the enterprise engaging in such solutions, the real benefit comes from the value these solutions generate for the enterprise's customers. As a result, pricing plans designed to encourage use of devices should be a major focal point, rather than plans solely designed to enhance data usage.

Monetization systems that only address traditional subscription business models may not be adequate for meeting the needs of more advanced IoT solution strategies. Incentivizing an increase in the number of devices used in a solution involves a different mindset, tied to how usage is measured and billed—as noted by the HP printer example previously discussed.

- **Automated Solutions** – With such low ARPD values, an IoT solution supplier must not only control costs to achieve business success, but also automate as many process steps as possible. In addition, supporting new pricing models, as IoT solution requirements are modified or as customer needs change, is fast becoming a new business norm.

Rapid change means configurable monetization systems that business analysts can use, rather than depending on the programming skills of IT resources. The monetization needs of one customer or business challenge are not the same as another; yet, both solutions demand that each be monetized to the fullest extent possible. An IoT solution supplier that engages with a flexible, real-time monetization system will have the greatest level of success.

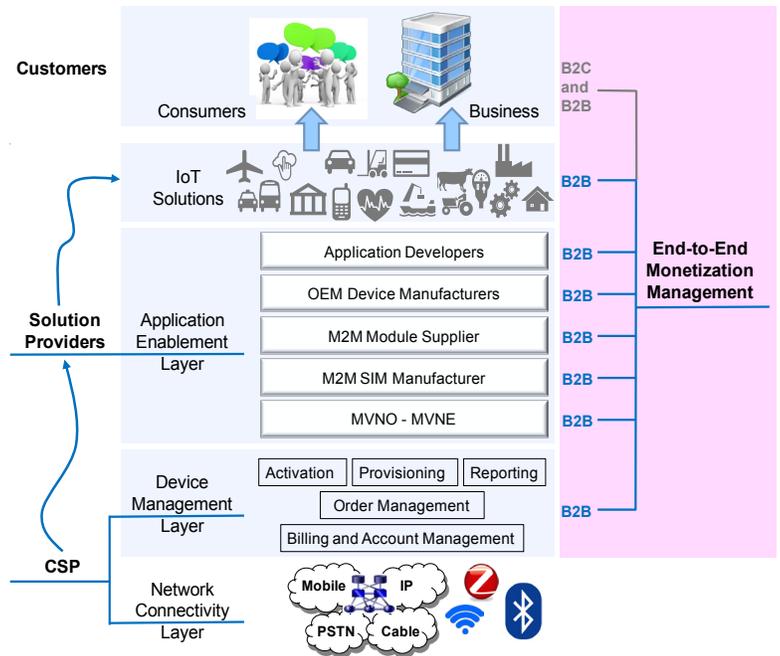
Why Real-Time Monetization is So Important to IoT Solutions

Partner contributions to an end-to-end solution must be accounted for and reconciled according to agreed upon terms. From the solution supplier's perspective, which can involve network operators heavily invested in IoT, the sum of partner costs weighed against received customer revenue defines profitability. With so many moving parts, especially multiple business processes and systems, it is easy to get data transactions “out of sync”—or worse, skipped entirely.

In the haste to bring together essential components of an IoT customer solution, IoT solution providers may either overlook or lack the proper monetization platform to record and define each of the B2B partner transactions that must be weighed against any revenue received from the end customer. More precisely, IoT technology-focused solution platforms now on the market can address many operational and service activation needs, but such platforms often:

- Lack a robust means for defining and creating pricing offers for an end-to-end solution aimed at addressing particular customer challenges.
- Do not accommodate a template-free capability to define a customer's IoT solution and pricing needs.

- Are unable to track each of the B2B relationships and partner contributions to an end-to-end IoT solution offering. These may be various partners independently contributing to the full solution offering, as noted by the right side of the figure on this page; or as a tiered structure of contributors where one B2B2B group would combine with another B2B2B group, along with several other partners (B2B), for the full IoT solution (not pictured).
- Cannot collect usage information from each contributing component that defines an IoT solution; nor report on the effectiveness of each component to the IoT Solution Provider, a customer, its customers, or any others with a need to know relationship.
- Cannot automatically show component-level usage details for a given customer solution, which is critical for creating customer bills. This is especially concerning when reporting business results that summarize status of multiple IoT solutions for the same customer.
- Lack the flexibility to make quick price changes, to either increase the customer’s interest level in activating more devices, or in defining new usage options tied to a customer’s current device configuration.
- Are unable to allocate the appropriate share of revenue to participating partners for each pricing offer, especially if more than one pricing offer is in effect for the same customer.
- Do not offer customers and suppliers a real-time means for tracking revenue generation against revenue commitment.



These monetization process problems, and many others similar to them, can be rectified through the use of a robust real-time rating & charging system. As robust, this system has advanced flexibility to meet changing business needs, which clearly involve the creation of new pricing plans. The platform must also respond rapidly to change—modification of pricing plans in minutes or hours according to market redirection; not the days, weeks or even months that are so common with most IT processes today.

The LogiSense Billing Solution Usage Rating and Billing Platform

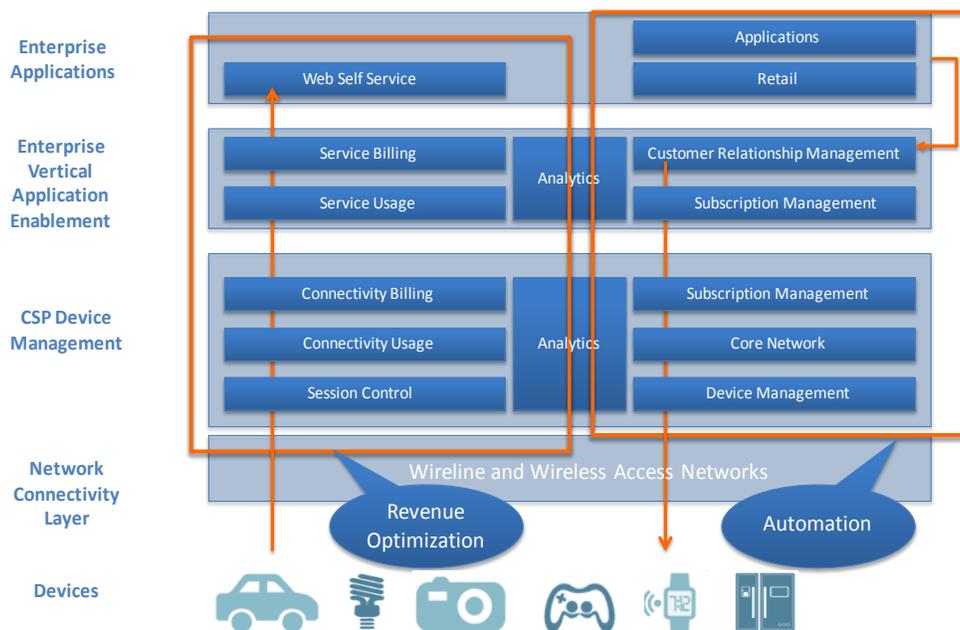
As discussed throughout this report, a real-time monetization platform, with the ability to track and report on individual partner contributions within a B2B2X-defined business solution is strategic for the IoT Solution Provider market. Shown previously in Figure 1, various IoT partners, such as a SIM manufacturer or device software developer, need strong accountability of their contributions in an end-to-end complex business solution. More precisely, they need indisputable confirmation emanating from the settlement process.

Equally important to accurate revenue management for these partners, and partners in general, is the need to understand how one organization’s functional contribution to an end-to-end business solution (IoT-based or otherwise) is used by the customer of such solutions, or the customer’s customers of these solutions. Accurate data collection and roll-up is strategic for this process.

IoT Solution Providers also need a means for billing the end customer of each IoT-based solution within a growing list of industries. The business needs of one industry are different from the business needs of another; hence, the role of IoT Solution Providers must be flexible. The tools used by them must be equally flexible and agile to address changing market needs.

LogiSense⁹ is a monetization solution supplier dedicated to solving the complex B2B monetization needs of the connected economy, with an emphasis on the CSP, IoT Solution Provider, and large enterprise markets. LogiSense provides its monetization capabilities through a licensed and Software-as-a-Service (SaaS) business model, in a way that allows IoT Solution Providers to automate several process steps, and to optimize revenue, as noted in Figure 2.

Figure 2: LogiSense Automated IoT Solution Enablement

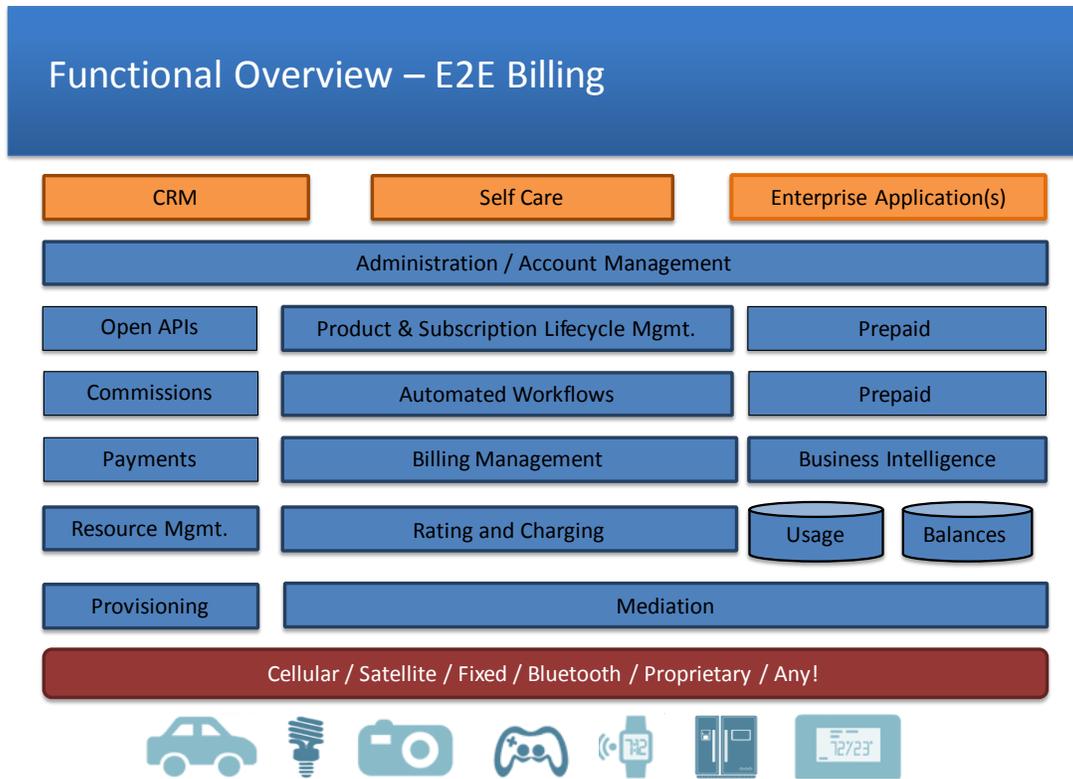


Source: LogiSense

⁹ Founded in 1998, LogiSense is a privately held supplier of monetization solutions, headquartered in Cambridge, Ontario, Canada. The company provides real-time mediation, usage rating & charging, and billing for IoT Solution Providers focused within the telecommunications, unified communications, and enterprise services markets.

The IoT markets covered by the LogiSense current customer base include the manufacturing sector, energy (oil and gas), retail (mostly point of sale terminals), financial services, healthcare, government, and utilities. The company focuses on the Tier 2 and Tier 3 CSP markets, with a growing customer base of direct enterprise customers. Monetization functions provided by the LogiSense billing solution end-to-end usage rating and billing platform are shown in Figure 3.

Figure 3: LogiSense Billing Solution Platform Functional Architecture



Source: LogiSense

Some of the more prevalent monetization capabilities enabled by the LogiSense billing solution platform include: simplified creation of complex rate plans, including tiers, multiple keys, service bundles and discounts; support for frequent and rapid rate plan changes, which is critical for competitive pricing; rating for prepaid, spending control, or pre-delivery charging.

As a test of the flexibility and agility of its solution capabilities, LogiSense recently announced a partnership with Numerex, a managed Solution Provider focused on the M2M telemetry market for over 20 years.¹⁰ The LogiSense billing solution monetization solution is used to help Numerex deliver monetization control to IoT-based business processes, which now enables Numerex to offer its enterprise customers advanced service options for their customers. As LogiSense explained to Stratecast, the business models deployed by each Numerex customer are different—which was a driving factor for Numerex to partner with LogiSense.

¹⁰ See LogiSense Press Release titled: [LogiSense Billing Solution Usage Rating and Billing Platform Selected by Numerex](#), Jan 26, 2016. Numerex (NASDAQ:NMRX), considered a pioneer in the M2M and IoT space, is focused on enterprises in many different industry verticals.

Stratecast The Last Word

IoT solutions hold an almost limitless set of possibilities, for both the supplier ecosystems that create them and the customers that use them. Some say that 90% of the “things” that can be connected are not yet connected, which boosts the business opportunity for those addressing the IoT marketplace.

With technology advances in SIM card production, and the use of mobility services in devices that have previously never been “smart,” a vast number of new IoT service and business opportunities abound. However, as noted by Figure 1 of this SPIE, assembling the wares from multiple suppliers, and keeping track of each organization’s contributions, can be daunting. Many IoT Solution Providers are recognizing the challenges with building technical solutions for a single customer that not only involve thousands of endpoints and data connections, but can be managed and monetized by an entirely “hands off” approach. Often, the monetization of multiple B2B partner contributions to an end-to-end IoT business solution are either neglected or very poorly managed, due mostly to a lack of the right tools. Stratecast believes that any successful IoT solution strategy must define the total accountability of each B2B business relationship contributing to an end-customer solution.

Some network operators, such as AT&T, SingTel, Verizon and a few others, have found success in the IoT solution market already. For example, in AT&T’s mid-December 2015 press release, titled [*AT&T Sees Phenomenal Momentum in the Internet of Things in 2015*](#), the company stated it had signed more than 300 IoT deals that year, to connect devices across the automotive, shipping, industrial, healthcare, home security and smart cities sectors. Similarly, Verizon noted in its fourth quarter 2015 financial call, conducted in late January 2016, that the company had “. . . created an ecosystem that will foster innovation and scale globally . . . with revenues of approximately \$200 million in the quarter and about \$690 million for the full year.” Verizon focuses on energy and utilities, manufacturing, smart cities, and transportation sectors with its IoT business strategy.

For many CSPs and their solution partners, 2015 started what 2016 will carry to new heights. The IoT global market is expanding rapidly, and there is money to be made. CSPs are not alone; other non-CSP companies are tapping into the IoT solution opportunity. For CSPs, will there be enough money from IoT solutions to offset declining revenues from traditional network-based services? Also, will there be enough profitable business opportunities for both CSPs and their IoT competitors? Only time will tell for sure. However, the real question to ask is how effectively are IoT Solution Providers monetizing the IoT-based business opportunities that are presented to them, and are the solutions they deliver actually profitable?

Karl M. Whitelock

Global Director Strategy – Operations, Orchestration, Data Analytics and Monetization (ODAM)

Stratecast | Frost & Sullivan

kwhitelock@stratecast.com

About ODAM

The processes and tools that communications service providers (CSPs) have utilized to run their businesses have changed over time. More than a half-century ago, CSP network and business management (OAM&P) processes were manual. As CSPs evolved over the years, so did the operations support systems (OSS) and business support systems (BSS) that address CSP business and network management needs. In recent years, the lines between OSS and BSS have become less clear, with much overlap. In addition, the roles in which OSS and BSS operate have expanded beyond traditional boundaries. As such, Stratecast now uses the term Operations, Orchestration, Data Analytics & Monetization (ODAM) to encompass both the traditional OSS and BSS functions and the new areas in which business and operations management must now work together, including virtualized networks and telecom data analysis.

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