



M2M

State Of The Industry

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The M2M Education Continues

With *M2M: State Of The Industry*, we're bringing you M2M information based on what you said was most valuable for you to further understand.

Last year, *Integrated Solutions* formally introduced M2M technology with our M2M 101 supplement. M2M 101 provided an introduction to the components of an M2M solution, a primer of basic M2M terms and definitions, and an overview of the impact M2M technology can have on an enterprise. With the basics of M2M covered, the opportunities for this year's M2M supplement were endless — and rather than guess which concept was best, we put the decision in our readers' hands. Besides some expert insight from Sam Lucero, practice director of M2M connectivity at ABI Research, on the state of the cellular M2M industry, the contents of this supplement are entirely

based on a recent survey of *Integrated Solutions'* readers.

The insight we gathered through the survey was not only very interesting, but also provided great direction for the content of *M2M: State Of The Industry*. First, 45.6% of the respondents reported their current level of understanding regarding M2M technology to be minimal, and another 38.8% reported their M2M knowledge level as moderate. Moreover, 37.2% of respondents stated they had not yet considered an M2M solution because they don't know enough about the technology to make an informed purchasing decision, and 18.4% of respondents haven't deployed M2M because they feel they haven't found the right solution for their business needs. Gathering these data points from our readers reaffirmed the notion that this supplement — an educational tool dedicated to furthering our audience's understanding of M2M technology — is indeed a valuable resource.

From Remote Monitoring To Smart Grid: M2M Deployments Prove Business Value

When asked what they felt they needed to understand better about M2M technology (M2M applications and how they drive business value, hardware components of an M2M solution, software components of an M2M solution, wireless connectivity options and cost considerations, what's involved in an M2M installation, or who to work with on an M2M deployment), an overwhelming 61.9% of respondents reported that they need to better understand M2M applications and the business value they provide. Which applications are of the most interest? Respondents ranked telematics, remote monitoring, asset tracking/management, and Smart Grid at the top.

Those four applications — and the business value that results from deploying them — are the basis for *M2M: State Of The Industry*. In this supplement, we'll take a look at various organizations deploying telematics, remote monitoring, asset tracking, and Smart Grid solutions and uncover the value they're experiencing from the technology. There is a multitude of ways that M2M can be used — and a variety of business benefits that stand to be gained — but we're covering these specific applications because they matter most to you.

To those of you who took the time to complete our recent M2M reader survey, I thank you. And to all of you, I hope the information provided in this supplement furthers your understanding of M2M and helps you determine how you could be using M2M technology to drive benefit in your own organization.




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The State Of The Cellular M2M Market

Sam Lucero of ABI Research gives his expert insight on the cellular M2M industry.

The cellular M2M market is one aspect of an overall trend toward enabling everyday objects and devices to communicate with each other and with server-based application infrastructure. This overarching trend has sometimes been called “The Internet of Things” and, in its broadest sense, includes a multitude of technologies and applications, including RFID (radio frequency identification), wireless sensor networking, industrial and building control systems, home automation, and the Smart Grid. Clearly, cellular technology offers significant benefits, particularly around mobility and ease of WAN connectivity, for a

multitude of M2M use cases. This article will briefly analyze how the cellular M2M market has fared during the global economic crisis, examine key current market and technology developments, and discuss future trends and opportunities.

M2M During The Economic Downturn

A key bellwether segment of the cellular M2M value chain is comprised of about a dozen M2M-

oriented radio module providers that bundle cellular semiconductor parts into precertified components for OEMs and application providers. These vendors include traditional players, such as Cinterion Wireless Modules (recently acquired by Gemalto), Sierra Wireless, Motorola Wireless Modules, Telit Communications, Enfora, SIMcom Wireless Solutions, and Sagemcom, as well as newer entrants, such as Huawei, ZTE, u-blox, and Fusion Wireless.

The M2M module market suffered a steep decline in annual shipment volume growth rates as a result of the global economic crisis. It is important to note, however, that unit shipment volume growth was still positive in 2008 and 2009 overall. On a global unit shipment volume basis, the market grew 25% in 2006, 37% in 2007, but only 4% in 2008 and 7% in 2009. In contrast, cellular operators and MVNOs (mobile virtual network operators) offering M2M connectivity services benefitted from the ongoing subscription nature of their segment of the value chain. While the overall rate of growth did decline marginally, the drop was not as significant as faced by the module vendors.

The Current M2M Environment

Each successive quarter in 2009 was better than the prior quarter for the module vendors, and several reported unit shipment volumes in 4Q09 as 30% - 40% higher compared to 1Q09. The cellular M2M market appears once more to be on a strong growth path. This is not to say that the module vendors escaped unscathed. Wavecom was acquired by Sierra Wireless in January 2009. In March 2009, Kyocera Wireless Modules announced it was closing operations. Most recently, Cinterion Wireless Modules announced its acquisition by Gemalto in June 2010.

At the same time, new entrants to the market have served to keep up the pressure on module ASPs’ (application service providers) margins. Most notably, Asia-Pac-based equipment vendors Huawei and ZTE have joined the fray and with their inherent cost advantages are contributing to a general shift among the traditional players, away from competing solely on module sales and towards being able to add more value in software and services as solutions providers.

Future M2M Industry Focus

As the module market becomes increasingly competitive and mobile operators enter the M2M market more directly, both module prices and M2M airtime connectivity rates have become increasingly competitive and less of a barrier to overall cellular M2M market adoption. While different applications will have different cost considerations, the decreasing costs of enabling connectivity make it increasingly easier to develop positive business cases for a growing number of M2M applications.

However, application development and deployment is still a key challenge for the market. This leads to increased delay and costs for M2M application adopters seeking to utilize such applications. There is already significant work under way to ease this burden for application developers. Merchant market service delivery platform vendors, such as Jasper Wireless and nPhase; MVNEs (mobile virtual network enablers), such as Wylless and ASPIDER Solutions; and operator “home-grown” solutions already exist. And, ABI Research believes an increasing focus of the industry as a whole over the next several years will be on the development of SDP (service delivery platforms) and related application middleware. These developments will help to increase choices, enhance functionality, and decrease costs for end adopters of M2M solutions.

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Remote Monitoring

With M2M remote monitoring, billion-dollar Lamar Advertising has reshaped the way it does business. Previously, the company's 900 field technicians were responsible for manually adjusting billboard timers and turning on displays on more than 150,000 billboards. The technicians also had to drive around nightly to spot-check bulbs and make sure the billboards were lit properly. Because this task couldn't be completed during the normal workday, it cost Lamar in overtime pay and added fuel expenses. When bulbs did burn out and went unnoticed for any amount of time, the company was forced to reimburse customers for downtime.

To solve these challenges, Lamar turned to a cellular-based M2M remote monitoring solution that enables Lamar to remotely monitor the status of each billboard and control lighting from a remote location. The units placed on each billboard collect data, including whether lights are on or off and whether the electrical load of the lighting is normal to determine if there are any outages (and to caution of potential outages to avoid downtime). As a result, not only has Lamar eliminated the overtime and fuel costs associated with nightly technician rounds, but the company is also averaging an energy savings of 25% on billboards with the remote monitoring solution in place.



Agilent Technologies manufactures and provides maintenance for high-tech instruments used in chemical, pharmaceutical, and other types of laboratories. The complex instruments have to be kept in optimum condition, which means tight SLAs (service level agreements) for repairs. However, meeting these SLAs can be difficult when a service technician doesn't

know what the problem with the instrument is until they arrive on-site. If a technician arrives with the wrong parts or discovers on-site that the issue could've been resolved remotely, Agilent wastes valuable time and resources.

To avoid these problems, Agilent recently deployed a remote monitoring solution, which facilitates real-time communication between the customer having an issue and an Agilent technician. The remote monitoring solution provides a "push for help" button on a customer's PC, and clicking the button sends their contact information and instrument data directly to an Agilent technician. Now, rather than going on-site with little or no information as to what the problem is, technicians can view in real time the performance data of the instrument. This enables them to identify the problem and determine if it can be resolved remotely or requires an on-site visit for repair. Since installing the solution, Agilent is able to resolve more customer issues remotely and has increased its first-time fix rate of on-site repairs by 20%.

Telematics

Chicago's Department of Streets and Sanitation operates a fleet of more than 1,600 vehicles, and more than 3,000 employees are involved in the operation of these vehicles. Years ago, the department had no insight into the location or activity of its fleet. This changed when the department deployed a cellular-based fleet-tracking solution to gain visibility into the location and operation of the vehicles. Soon after, Chicago's Bureau of Sanitation adopted the fleet-tracking solution for its fleet of 600 waste disposal and 335 recycling trucks.

In addition to location data that enables the city to more efficiently dispatch vehicles and develop productivity benchmarks, Chicago plans to incorporate telematics data into the solution that will provide real-time information on how often a truck's flipper or compactor is used, the weight of the bucket, and the overall condition of the truck. This data not only allows the department to understand the efficiency of its crews and vehicles in more detail, but also to achieve its environmental initiatives. Telematics data like that which Chicago plans to collect helps a variety of organizations optimize routes, decrease excessive idling, and reduce mileage to reduce fuel consumption — all of which cut costs for the company while positively impacting the environment.

Namasco Corp., a distributor of steel products, operates a fleet of 225 diesel flatbed tractor trailers. Since installing a Web-based telematics solution that combines GPS and cellular M2M technologies, Namasco has experienced a number of benefits. The company is able to determine when drivers are getting off routes or driving out of the way and can use this data to eliminate nonproductive and costly miles. Namasco can also uncover instances of trucks idling unnecessarily, which is also costly. With the ability to see when these things were happening and therefore take measures to eliminate them, Namasco is saving more than \$500,000 per year in fuel costs.

The telematics solution has also enabled Namasco to increase driver safety by providing real-time data to Namasco on the speed at which each trailer is traveling and the instances when drivers brake too quickly or aggressively. Namasco sets speed and braking parameters so that when a driver is operating unsafely, alerts are sent to management to intervene. Unsafe drivers are required to attend remedial training, while drivers who consistently hit safe driving goals are rewarded for doing so. Further, real-time data on the operational performance of the vehicle enables the company to proactively schedule repairs and services.

Asset Tracking

Texas-based Warren CAT operates five divisions including heavy construction and governmental, rental and general construction, engines and generators, agriculture, and parts and service. While Warren CAT has been serving the Texas area for 25 years, the company recently experienced expansion in its rental business of construction equipment. Before, Warren CAT relied on the honesty of its customers and hard work of its service department to track and maintain rental equipment, but as business expanded, the company needed a better way to ensure the efficiency of its rental operations.

Warren CAT management decided to install an M2M-based asset management solution on its rental equipment. The company installed mobile terminals on more than 250 pieces of equipment, ranging from portable generators and pumps to air compressors and light towers. Data collected from the equipment includes location as well as information on when the equipment is running versus sitting unused. Having this data enables Warren CAT to precisely track the location of all of its equipment, accurately manage consignment billing, and monitor hours of usage of the equipment to appropriately schedule preventative maintenance.



Sometimes, the most important asset you need to track is a person. S.A.F.E.R. (Search and Find Emergency Responders) is a nonprofit organization that understands this need and is dedicated to helping make this task easier. S.A.F.E.R. provides wireless tracking equipment to families and police departments to help quickly locate missing persons with dementia, autism, or other impairments that make them prone to “wandering.” Through S.A.F.E.R., families and law enforcement agencies can purchase a watch-like device for the affected person. The device, which works with cellular-based M2M technology and integrates into the 911 system, can be tracked with mobile receivers in case individuals go missing and can be integrated into an alarm system that sends alerts if the person tries to leave a specified area.

The cellular-based M2M communication was facilitated by an MVNO (mobile virtual network operator) because of the reach of the coverage needs (across multiple carrier networks). With the M2M-based tracking solution, families and law enforcement agencies have real-time visibility into the location of their loved ones and patients, which increases the speed and efficiency of search-and-rescue efforts and reduces the cost of labor for law enforcement agencies involved in such efforts.

Smart Grid

Central Iowa Power Cooperative (CIPCO) is a generation and transmission cooperative that serves 12 rural electric cooperatives that provide electrical service to more than 316,500 Iowans. CIPCO collects power measurements each month by reading wholesale meters. Until recently, this was completed by field technicians using hand-held devices and optical cable to collect power measurements. Because of the time this process takes to complete and the distance between metering points (the service territory covers more than 300 miles), each technician was only able to complete 12 to 14 reads each month — at a cost of \$30 per read.

To replace these manual methods, CIPCO turned to an M2M-enabled AMR (automated meter reading) solution. The solution provides remote monitoring and two-way communication to allow remote data collection and control, virtually eliminating the need for field technicians to visit CIPCO’s rural substations. Now, rather than incurring a cost of \$30 per individual meter read, CIPCO pays only \$10 a month (total) for cellular service to collect the data remotely. Besides the direct cost savings, CIPCO has benefited from more accurate billing, electrical load research capabilities, and improved capital planning.

Trico Electric Cooperative operates more than 40,000 meters across more than 3,100 miles of energized line in Arizona. Because of the breadth of Trico’s service territory, meter technicians required a minimum of two days and 200 miles’ worth of driving to gather data from each meter site monthly. In total, a month’s worth of meter reads equated to 60 hours of labor. To reduce these costs, Trico turned to M2M-enabled AMR. The cooperative deployed smart meters at the locations throughout their service territory that were hardest and most time-consuming for technicians to reach. The smart meters Trico deployed utilize cellular M2M technology to transmit energy consumption data directly to headquarters, eliminating the need for on-site readings.

While the most intuitive benefits of Trico’s AMR deployment are time and cost savings — the readings that previously required 60 hours of labor per month now take only five minutes — those aren’t the only benefits. Trico has also been able to set up automated outage notification emails, create meter error reporting, and access improved time-of-use data to provide customers with more accurate usage data.

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