

The Future of M2M: Technology to Transform Business

by Peter V. Leparulo, Chairman and CEO, Novatel Wireless

There is no doubt that Machine-to-Machine (*M2M*) communications is a promising area that provides a wealth of new applications. What's more, these applications can transform the businesses in more than just procedures. Such are the effects on speeding up transport, managing cargo and optimizing crate environment while in transit, that businesses find that M2M is a necessity, not a luxury. Metering and remote control of consumption and flow are transformed into real-time management. Home security and remote health-care lead the way in affecting consumers and patients' lives. Such systems all need to be supported by a device-enabling platform that in itself utilizes M2M to provision, activate, upgrade and monitor these remote devices.



Peter V. Leparulo has served as a Novatel Wireless director since May 2003, as the Chairman since November 2006 and as Chief Executive Officer since April 2008. From May 2001 to January 2003, he served as our Senior Vice President, General Manager, CDMA Operations. From September 2000 to May 2001, he served as a Senior Vice President, Corporate and Strategic Development and General Counsel.

From June 1998 until September 2000, Mr Leparulo was a Senior Partner at the law firm of Orrick, Herrington & Sutcliffe LLP, where he specialized in corporate finance, mergers and acquisitions, securities, intellectual property and general corporate matters. Prior to joining Orrick, Mr Leparulo was a Partner at the law firm of Pillsbury Madison & Sutro LLP, from January 1992 until June 1998, and an Associate at that firm from October 1989 until January 1992.

Peter V. Leparulo holds a Bachelor of Science from Colgate University and a Juris Doctor from Case Western Reserve University.

Machine-to-machine (*M2M*) communications have the power to reinvent business. There are examples of M2M communications in every industry with prominent features highlighted in industries including transportation and logistics, smart-grid and connected homes and healthcare. The combination of backend service enablement platforms, service delivery platforms and intelligent devices in the field remove barriers that were previously hindering M2M market growth.

Berg Insight estimates that the number of cellular network connections worldwide used for M2M communication will grow from 81.3 million connections in 2010 at a compound annual growth rate (*CAGR*) of 32.0 per cent to 294.1 million connections in 2015. In the coming years, millions of motor vehicles, utility meters, consumer electronics, tele-health/medical devices, security alarms and other machines will become networked using M2M, advanced service enablement and service delivery platform technologies.

Service delivery platforms provide a software service infrastructure that can manage multiple wireless edge device environments and store all of the edge data in a single database environment. Applications can use that data for a variety of reporting, management and service enablement purposes. Such a service delivery platform should provide standards-based services and tools to:

- collect and process data from multiple wireless devices
- integrate data collected into existing applications and IT systems
- manage wireless device provisioning, deployment and updating
- secure remote access to control and manage assets
- custom report and map assets.

With these tools, carriers and Mobile Virtual Network Operators can deliver vertical market solutions that enable customers and enterprises

to access remote assets with real-time visibility for improved decision-making. M2M can connect virtually anything. The result has been an explosion in the number of possible business and consumer M2M applications.

The future of connected transportation with M2M

The Internet is heavily used to track personal shipments and deliveries. Real-time tracking applications based on M2M technology aren't just good for the consumer - they also help logistics companies control shipment and warehouse traffic, monitor shipment quality and even adjust regional business strategies. M2M solutions are no longer a luxury in logistics - they are a competitive necessity.

Intelligent devices are being paired with a variety of sensors in vehicles such as GPS, accelerometers, vehicle data, and driver ID to provide numerous benefits including improved driver performance, reduced idle time, reduced accidents, lower insurance

rates, enhanced fleet management and even environmental benefits. With an M2M deployment, drivers will waste less fuel and time looking for delivery destinations, gas stations and other locations, decreasing costs and improving efficiency. As is the case across vertical markets, the service enablement platform should allow applications to be initially developed and fully integrated into the enterprise IT environment, deployed in scale and managed over the full life-cycle.

Vehicles in motion are not the only possible beneficiaries of M2M solutions. Each year, millions of containers reach train stations, ports, airports and other transport hubs. Connected containers allow for the transport of cargo to be more secure and efficient by offering real-time asset tracking, increasing operational efficiency for transport service providers, while lowering both operational costs and damage claims. Companies who utilize connected containers benefit from increased inventory flexibility, customer satisfaction and the ability to optimize pricing structures.

In the container portion of the supply chain, intelligent M2M devices can also offer service providers and customers accurate, real-time information such as location, weight, temperature, humidity and monitoring for shock or tipping of shipping vessels and/or cargo to ensure asset integrity. In many cases, these battery-powered applications on intelligent devices are used to optimize the life of assets in transit and meet reporting requirements. If anything was to go wrong, an alert message is sent, helping to increase regulatory compliance and ensure the quality of the items in transport, particularly for perishable goods and sensitive pharmaceutical products.

Additional benefits of a robust service enablement platform in the full supply chain scenario allow for shipment by shipment configuration of data collection/reporting, maintaining contact with battery-powered devices that are not always reachable and potentially even taking these devices out of service for seasonal applications.

Smart meters to account for nearly half of installed M2M devices

Even the most progressive of companies can strain their critical support and systems infrastructure as they struggle to meet today's increasing demand for energy. The smart grid delivers cost-effective and reliable services that are essential for any utility, regardless of whether for power and energy production, distribution and green/clean energy or demand response initiatives. A recent report from Juniper Research suggests that smart metering will account for more than 40 per cent of all connected devices by 2016, equating to an anticipated 400 million connected devices.

Smart meters are advanced meters that collect data around energy consumption and quality of energy supply at the location of the customer and then relay this information back to the utility company for monitoring and billing purposes. By utilizing wireless communications technology and automated processes, utility companies can deliver new service capabilities effectively, creating operational efficiencies that result in improved customer satisfaction, while simultaneously lowering costs. Successful smart grid packages are more than just intelligence at the edge, but throughout the entire infrastructure.

Two-way communication between the meter and the central system are enabled through smart meters, providing automated meter readings, customer relationship management, demand-side management and value-added services. A utility company can then use these readings to provide a more reliable and sustainable supply to both businesses and domestic consumers. Smart meters are a vital part of smart grids, as they create the intersection between customer premise and the public energy network.

There are numerous drivers and barriers that influence development in the market. Tax policies and macroeconomic factors, such as energy consumption patterns, play a major role. The regulatory and competitive environment in each country is also important for regional markets. From a device and deployment strategy, the long life (~20 years) of these products presents the biggest challenges - in these smart grid applications the device intelligence is concentrated on reliability/recoverability and paired with the service enablement platform for complete over-the-air reprogramming of upgrades to maintain network compatibility and enhancements without requiring a truck roll.

Connected homes and healthcare

The connected home - from security panels to securing personal assets - has energy-saving and green initiatives that can greatly evolve by incorporating M2M solutions. Consumers using M2M technology will soon be able to remotely view utility consumption. They will be able to control lighting, heating and even the charging of an electric vehicle from a smartphone or a similar control module. Not only will the consumer benefit from these advancements but utility companies will be able to monitor and control consumption much more effectively and use real-time data from smart meters to provide tailored offerings straight to the user.

The intelligence of security applications is an area where the connected home realization has already started by enabling real-time data including alarm panels, intelligent locks, asset

monitoring devices and the latest in high-quality video capture and transmission. These solutions are already branching out to include thermostat and lighting control options. With a host of embedded platforms and simple integrated devices, M2M communications can offer homes of all sizes resilient, high-speed, scalable, and reliable end-point security and asset-monitoring connectivity solutions.

As homes and security become more interconnected through M2M solutions, wider deployments of remote healthcare will be realized. Connected health aims to increase healthcare resources and provide flexible opportunities for consumers to engage with physicians and better self-manage their care from the comfort of their own home. Remote healthcare can utilize M2M technologies to deliver patient monitoring and care outside of the hospital, saving expensive and time-consuming office visits and at the same time delivering higher quality care.

Machina Research published its second Connected Intelligence report, entitled 'Machine-to-Machine Communication in Healthcare 2010-20'. The report predicts that the installed base of M2M-connected devices within the health sector will exceed 774 million by 2020. North America will be the largest region, with a share of worldwide-connected medical devices peaking at 54 per cent in 2014.

As M2M technologies become more advanced, a connected home could effectively monitor various health conditions. Readings as simple as daily diagnostics and movement status or as advanced as insulin pump status, blood pressure or heart patient readings, can be communicated to health centres and monitored remotely.

A world ready for M2M

With technological, political and economic factors coming together, M2M will continue to see strong growth. As new infrastructure replaces the old, companies and governments have the opportunity to drastically alter their businesses by implementing a technology strategy that is not only more efficient, but enables new levels of service and economy.

Flexible, intelligent devices make M2M a transforming technology that enables businesses to simplify, renovate and enhance in entirely new ways. Coupling these devices with a robust service enablement and delivery platform makes these deployments scalable today, delivering actionable data directly into the enterprise applications. It enables dynamically managing end-to-end solutions from deployment to full life-cycle, including even billing and expense management. The possibilities are endless. ●