How can 'machine-to-machine' (M2M) connectivity take your business to another level

How can "machine-to-machine" (M2M) Connectivity take your Business to another level? A question that requires answering for many business leaders, managers and engineers immersed in the bombardment of information around the "Internet of Things"(IoT). It may be that you are coming at this for the first time, or you may be deeply involved in many years of communication solutions. Either way, things can become more complicated than they need to be, either in the form of the fog created around an area that you may want to learn more about, but don't know which path to follow, or at the other end of the scale you are buried in a "solution fest" of possibilities, advancing everyday with something supposedly newer and better. This means that it becomes difficult to remember that when you started out all you wanted to do was send packets of data. This distracting effect often ends in over-engineered solutions, overspending, and generally a loss of time as too much evaluation is incurred.

This is indeed what we see on many occasions with several clients' projects. It's easily done as the M2M market explodes into a frenzy of activity. However, it is often the case with the more industrial applications, that equipment, especially remote equipment, just requires a way of being connected to a central hub or office, such that vital parameters relating to performance and service are readily accessible. We simply call this "providing network connectivity for your equipment" or "helping your equipment to talk"!

The challenges for the business world are not to see who has the glitziest, leading edge equipment but how to decide which machine-to-machine solutions can add value and benefit their client's businesses at the right price point. Cutting through the "fog" of so many products and solutions is tricky, and so, if like in most mainstream industrial applications, all you or your clients need to do is get connected to remote equipment or assets on a frequent or infrequent basis then a mainstream approach could very well be your saviour. What really keeps people up at night is the thought of how they can increase performance in their business, or save costs, improve efficiency, or how they organise their business to take advantage of new or even yet unknown opportunities.

These are the challenges that Siretta experiences with clients in many industries and throughout many applications, such as, in the vending industry, tank monitoring, parking, traffic monitoring, temperature logging, access control systems - all examples of where information was not readily available without visiting a remote location to fix up some form of measurement device. After measurement, the device complete with its downloaded data, would then need to be taken back to an office for extracting the data and analysing on a PC. All very good, but in today's world a very costly process tying people and equipment up and consuming vast amounts of time. Imagine all of this being compressed down into the touch of a button at a person's PC.

So, what is actually required in most cases to affect a concise, compact and cost-effective solution for remotely located site equipment? In most instances the laying of cable to gain connectivity with a remote site location is prohibitive, and so the demand for a long range wireless communication is the effective alternative. In most cases, with the applications mentioned above, the concept of a "point-to-point"(one location to another) cellular communication solution is adequate to make the connection between the remote equipment and a central office or hub. In most cases the information required is not vast and the frequency with which it is required is relatively low e.g. take the case of meter reading, where you want to monitor consumption, but not necessarily, every second of the day. Equally, having upper and lower pre-set tolerances, that when breached, allow for an alert to be sent, would again, only require small amounts of data and potentially infrequent transmission.

Other considerations of a "point to point" cellular communication solution will be the reliability of connection, robustness of the network, which level of technology to choose, time to market and so on. These are some of the points we consider here.

When it comes to long range wireless communication, the cellular network is regularly chosen for mainstream industrial M2M applications. It is long established, has the infrastructure in place already, throughout the world, and has various levels of network standards connectivity (2G(GSM), 3G(UMTS) and 4G(LTE)) to allow the most appropriate decision to be made for the application.

Assuming that you will always want a reliable connection on a well-established network, we should then explore the network technology level, to see which is most suited to a mainstream application, i.e. 2G, 3G or 4G.

Taking each in turn, 2G is still prevalent in most of Europe and suffices for many low data rate transmissions, but in time there is always the thought of switch off, as more applications migrate to 3G in many cases and 4G in some cases.

3G, although it has not been around for as long, is well deployed and growing. In the view of most industry commentators it should be around for a good few years yet. It is naturally blessed with a greater transmission speed than 2G, typically transmitting data in megabits per second, rather than kilo-bits per second, and has seen its costs closing the gap between itself and 2G. As a result, more and more applications have migrated from 2G to 3G to take advantage of this, plus the greater bandwidth, whilst not incurring the much higher cost of moving all the way to 4G. 4G in

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M2M is much less prominent having only really started seeding itself in recent times. As a result, the economies of scale mean costs are high vs. a solution that generally only requires the speed of the 3G network, and hence we see a bulge in the number of 3G M2M applications.

Some of the reasons 3G has become the "standard" network technology level for many industrial M2M solutions, are because it has the feel of reliability, many adopters, longevity, good infrastructure, and coverage across urban and rural areas. Because of the growing applications the economies of scale have brought prices to a very competitive level, and many 2G M2M users have, by now, migrated to the 3G level. They are enjoying the benefits through greater speed and newly created opportunities – quicker transactions, the sending of greater amounts of data if required, and in the UK, having the chance to pick between 4 network providers rather than just the 3 network providers that are providing the 2G service. Therefore, a lot is going on in 3G M2M.

Connecting your business to your remote equipment, so that you can harness the power of the cellular network means using a modem-based device. The remote equipment would usually connect to the modem through a serial interface, such as RS232 or USB. The modem will transport data over the cellular network to a monitoring location where analysis and decision making can take place, based on the data sent. The solution will require some form of programming, for example, to know when it is supposed to send or receive data, but this should be quite straightforward for a person with programming knowledge.

Then there is the consideration for time to market. The choices you have here are to make up your own solution from discrete components, or to buy in a ready-made solution in its own enclosure. The former solution comes with its challenges, not least of which is the cost of design, development, test and approval, but all of this may be viable for long term road-mapped, high volume solutions. Often, small to medium volumes are the case for many industrial applications, and time to market is often short, which means that an already proven integrated/modular solution is required e.g. the modem in a modular enclosure.

Siretta, has addressed many projects using their modular (boxed) modems to effect connectivity with remote equipment in many industries. Siretta has a range of 2G, 3G and 4G modems, for "machine to machine" applications.

Opportunities to save time, save money and generally improve performance and efficiencies will hopefully just be around the corner as remote assets provide you with information you need, when you want it.

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