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11 Myths About Cellular IoT

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As the Internet of Things (IoT) continues to grow at an ever-increasing rate, the battle still rages over which technology will ultimately succeed in connecting these myriad devices. Naturally, a number of myths have evolved concerning IoT connectivity. One such myth involves the viability of cellular technology, based partly on preconceptions from experiences with 2G and 3G technology. It's important to address these myths in order to make an informed decision when adopting an IoT strategy.

1. Cellular IoT consumes a lot of power.

It is true that, in the case of 2G, 3G, and LTE, cellular typically has entailed high power consumption due to the fact that these technologies were not initially designed for battery-life conscious applications and use cases.

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However, this is no longer a valid assumption. As new standards, defined under Release 13 (R-13), have factored in the specific requirement for long battery life and low power consumption, mechanisms are built into the standard to make chipsets and modules much more power-efficient. Altair has invested immensely into power-consumption reduction techniques, and others in the industry are working to follow suit, proving that even with pre-R 13 (CAT-1) implementations, cellular IoT chipsets can exceed 10 years of battery life.

2. Module cost can't compete with LPWA.

Low-power wide-area (LPWA) proprietary technologies, such as Sigfox and LoRa, being designed from the ground up for IoT optimization will naturally be low cost, as they will be lean and nimble with nothing more than what is absolutely required. Cellular, perceived as a typically broadband technology, is not seen as possessing the same cost efficiencies as LPWA.

However, R-13 standards aren't merely a trimmed-down version of previous releases and cellular IoT is not broadband—it's specifically designed to accommodate very low-cost implementations. While they do maintain the ability to coexist with existing LTE networks, this is a completely new standard. Designed to be small and nimble, and not derivative of broadband technologies, it doesn't suffer from the baggage of similar multi-modes with 3G fallbacks.

thermore, LPWA technologies have a distinct disadvantage: Because they're not standard spaced, they have ecosystem support and can't leverage the economies of scale in the same way as cellular. LPWA modules today cost more or less the same as CAT-1 modules.

3. Service cost can't compete with LPWA.

While cellular has become more economical, consumers do still pay a lot for connectivity. There's an assumption that even with the creation of defined IoT service plans, LTE will still be more expensive. A propriety LPWA technology running over an unlicensed spectrum will not entail any additional service costs, people suggest.

Once again, this isn't the case. Service cost is a matter of total cost of ownership (TCO), which will include spectrum costs, infrastructure costs, and operational expenses. As cellular networks are already up and running, there's no need to build anything new—the towers, real estate, power supply, and spectrum are already in place and paid for by smartphone users. At most, certain base stations may have to be upgraded and hardware replaced.

Conversely, LPWA necessitates the building of new networks. It requires deployment of new towers, buying or leasing sites, providing backhaul, and establishing a power supply—all of which will be added onto the service cost.

Therefore, from a TCO perspective, there will be little disparity between these two technologies. Cellular could even prove cheaper than LPWA for applications that consume super-low bandwidth, and carriers have no need to charge a premium.

4. Cellular IoT is difficult to design.

There's been some merit to this claim as, until now, cellular has required complex RF expertise and often entails a lengthy and expensive carrier certification process. All of that impacts the cost and time to develop a cellular module. However, starting in 2017, chipsets are expected to be so integrated that it will dramatically lower design complexity. This integration will also address the challenge of band fragmentation, eliminating band dependency.

5. It requires expensive and challenging certifications.

While this has been true for cellular requirements, mobile network operators understand that such expensive, difficult, and lengthy certifications for IoT chipsets and modules will result in costs loaded onto chipsets and modules. Therefore, carriers have a clear understanding that profits of certifying and accepting new chipsets and modules on a wireless network has to radically change—a change that's already happening as they build their IoT strategies.

6. Integration can only be done by a small universe of experts.

This claim arises from the high bar in terms of engineering expertise, the cost of bringing modules to market, and the fact that, in many cases, licensing agreements need to be signed with various patent holders. However, this paradigm is shifting. The industry is moving toward making designing much quicker and simpler. The end result will be that integrating a cellular IoT module or chip into a device should be as simple as adding Wi-Fi or Bluetooth capabilities.

7. Cellular has many bands; it's impossible to create a global modem.

Cellular currently does have many bands. However, when it comes to the IoT, this problem will soon disappear. Carriers have already limited the typical configuration to two bands, and new RF architectures enable the creation of a global modem that cuts dependency on external filters and band-specific front-end components.

8. Intellectual Property Rights (IPR) issues prevent it from becoming mainstream.

While cellular is notorious for having high IPR burdens, particularly for 3G, this has been less significant with LTE in general. Eventually, it will become completely insignificant in R-13 IoT (Cat-M1 and Cat-NB1), since the ecosystem will be much more balanced. No single large incumbent will monopolize a high percentage of IPR to dictate royalty rates. The IP will be spread much more evenly. There have already been public statements from big patent holders indicating that IPR rates for cellular products will be much lower than they are today.

9. SIM acquisition and management is cost/operationally prohibitive for many players.

It's true that current carrier requirements stipulate cellular IoT devices have a pluggable subscriber identity module (SIM) to facilitate the device's authentication with the network. And the acquisition and managing of these SIMs can be a challenging task.

However, a noticeable trend has emerged in the market of transitioning from pluggable SIMs to embedded versions. These will be little more than a small chip on the board or modem. Customers will no longer need to acquire a separate SIM and be responsible for keeping them up to date. It will become significantly cheaper and simpler because the SIM is already embedded in the module.

The space is dominated by large incumbents, such as Qualcomm and Intel, and conducting siness with them can be difficult.

This assumption stems from the fact that, in the smartphone space, this has indeed been the case. One would be hard-pressed to find a single cellular market without Qualcomm chips operating on it.

However, the dynamics are already beginning to change. The large incumbents, which built their competitive advantage by integrating as much as possible into a chip and constantly pushing the performance envelope, are now facing a very different market. The focus now is on chipsets requiring fewer features, reduced cost, and lower power.

This discontinuity has provided the opportunity for smaller companies with unique technologies to step in and claim a primary position in the market. For example, these smaller companies already have a higher market share in the CAT-1 space, breaking the monopoly held by the big players.

11. The multitude of cellular IoT standards creates fragmentation that increases cost and compromises interoperability.

Cellular IoT has two variants—Cat-M1 and Cat-NB1—which creates fragmentation in the market and leads to higher investment in developing chipsets. However, we're beginning to see the development of a multimode IoT chip capable of supporting both variants in one chipset. The ability to run both technologies on a single chip will mean that any incremental costs are marginal. Therefore, although the presence of more than one standard will always create some fragmentation, the market will certainly react positively to a product that supports both in a single chip, without any cost premium.

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