

Bridging the Gap Between Standards and Developers in IoT

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What is required to convert all the current hype around the IoT space into a real transformation force? Is it the identification of a “killer” protocol? Do we need the mighty companies to show us the path? The answer may be much simpler than we think but difficult to implement. In the world’s natural ecosystem, complex problems are resolved by each organism building on adjacent ones and providing support to others. By bringing this same concept to the world of IoT, we can begin to bridge the divide between the two ecosystems of SDOs and application developers.

The advent of the Internet of Things (IoT) and associated machine-to-machine (M2M) technologies offers unprecedented opportunity to transform the way we live, work and play. From healthcare to automotive to public utilities, there is almost no aspect of life that will not be touched by IoT. According to the 2015 Cisco® Visual Networking Index™ (VNI) Forecast, the number of IP-connected personal devices and M2M connections online will grow to more than 24 billion by 2019.¹ At first there appears to be different ways this can be achieved. Define the standards that can create a “plug-and-play” protocol that will resolve interoperability problems or wait for a

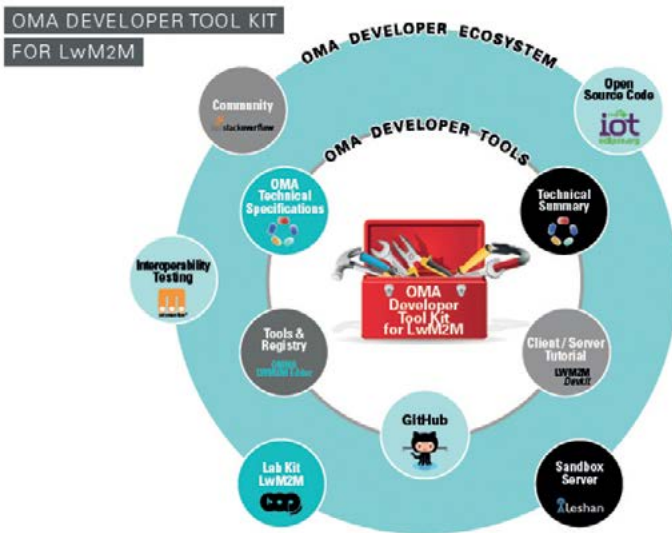
mighty company to create their own standard and the rest to follow up.

If we look at the standardization path, there is a disconnect between the communities that produce specifications and the communities that use them. This divide is one between the Standards Development Organizations (SDOs) that define how networks operate and deliver services, and the application developers creating apps and implementations for use over those networks. In other words, there is a divide between the two ecosystems. The traditional standards organizations don’t provide the correct support to the developer communities.

Much has changed in the wireless industry since SDOs such as 3GPP, ITU and OMA were formed. In the early days of wireless and the Internet, as fundamental technology was being invented, it was imperative for the growth of the new markets that standards be established prior to large-scale deployment of technology and related services. The process for development of these standards followed a traditional “waterfall” approach, which helped to harmonize (sometimes competing) pre-standard technical solutions into a single standardized solution to meet market needs.

However, the future of IoT will employ a process likely to be dominated by agile development of technology and platform prototypes often in open source, collaborative projects, which put a premium on “code first.” From that point of view, the key to the success of IoT resides with the developers and their communities. How can SDOs transform themselves to extend their influence and provide a value to the IoT industry in this radically changing world?

The IEEE defines standards as “...documents that establish specifications and procedures designed to ensure the reliability of the materials, products, methods, and/or services people use every day. Standards address a range of issues, including, but not limited to, various protocols that help ensure product functionality and compatibility, facilitate interoperability, and support consumer safety and



public health.² This definition was created in a different industry paradigm. However, it is still valid to say that only through the use of standards can the requirements of interconnectivity and interoperability of services and products be guaranteed. But, the standard doesn't provide interoperability by itself. It is the conversion of the standard into the source code that will guarantee interoperability among platforms and devices.

Standardization still provides benefits to the IoT value chain in several ways. First, SDOs and the multitude of cooperation agreements among them help the industry to prevent overlap of work and, therefore, fragmentation within the industry. Second, SDOs include players from across the IoT value chain, allowing insight into the entire system architecture. Without this, proprietary pieces of solutions coming from multiple vendors are unlikely to work together. Third, historical standards such as Device Management must continue to evolve as networks evolve to preserve interoperability and backward compatibility. Finally, SDOs provide a legal and business framework that ensures fair practices in licensing, participation rights, publication processes and conflict resolution.

Clearly, SDOs play a fundamental role in defining the complex system of M2M networks and services across the planet. As these wireless networks are evolving toward an all IP infrastructure and the Cloud, application developers have emerged as a new community of consumers for these standards. In the highly competitive world of application developers, where Open Source Software (OSS) is relied upon to produce the more than 1.3 million apps available on iOS alone³, the procedures and output associated with a traditional standard can be seen as archaic and slow to market.

The working styles of the standards communities and the developer communities are vastly different. The standards community is typically working to define a solution to a relatively complex problem in a way that creates a permanent solution that helps to establish integrity and interoperability in the network or service layer. When the work is complete, SDOs typically produce a specification, often in PDF, that is published for the industry at large to absorb and adhere to when developing their products or services.

Application developers are often reluctant to use these standards due to the lack of tools that facilitate adoption. Developers work with socially connected tools that allow for coopting, adapting, and republishing their work and the work of others. Developers access forums where they can raise questions, obtain references to tools or code and collaborate. All of this is far from what traditional SDOs provide. The vitality of the entire IoT ecosystem demands that the standards development community and the application developer community bridge the gap in work practices and deliverables to ensure efficiency and interoperability across the IoT value chain.

So the question remains how SDOs can adapt such that they better enable the application developer to take advantage of the standards they produce.

There is a growing number of individuals in the SDO community that believe that standards development processes and the output of SDOs can and must evolve to meet the needs of the IoT ecosystem including app developers. Recent initiatives from SDOs such as the Open Mobile Alliance provide tools to bridge this gap. Specifically, the OMA LightweightM2M Developer Toolkit provides the tools that the IoT developer needs to create innovative services and applications supported by the benefits of a standard. These tools are the outcome of re-engineering the interface between developers and SDOs, and include a client emulator, an editor to create objects and resources models, an objects and resources register, a GitHub code and specifications repository as well as bug tracking system, a lab kit of examples of how to use standards, a sandbox server for testing implementations, a user community and a listing of ongoing development projects based on standards. <https://github.com/OpenMobileAlliance/OMA-LwM2M-Public-Review/wiki>

As the IoT value chain continues to evolve toward all IP networks and a business model that includes the application developer community, SDOs must evolve to include them, as well. To do this, SDOs must enable the application developer community with tools that allow them to adopt the specifications they produce. An IoT ecosystem that incorporates the innovation and creativity common to developers, with the safeguards and interoperability inherent in standards development, brings benefit to the entire value chain. The IoT-related SDOs that will thrive are the SDOs who will embrace and address the needs of the developer community.

For more information visit: <http://openmobilealliance.org/>

- <http://www.cisco.com/c/en/us/solutions/service-provider/visual-networking-index-vni/index.html>
- What are Standards? Why are They Important?* By Admin in Inside the IEEE-SA, Standards at Work 10/03/2011 http://standardsinsight.com/ieee_company_detail/what-are-standards-why-are-they-important
- <http://www.statista.com/statistics/263795/number-of-available-apps-in-the-apple-app-store/>