Open Standards and Open Source

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The traditional means of innovating the mobile network has been through the thoughtful and consensus-based efforts of technologists working in a standards setting environment. However, the maturation of the Internet as an application platform and the related rise of Internet-enabled device and service providers, especially on the Web, have helped renew a focus on innovation and differentiation. The development of 5G networks and the Internet of Things (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". In light of this industry shift, the Open Mobile Alliance has embarked on a survey of mobile and IoT industry professionals to shed light on trends towards cooperation between the Open Standards and Open Source communities.

Open Standards and Open Source

Much has changed in the telecommunications industry in the years since Standards Development Organization (SDOs) such as 3GPP, ITU and OMA were formed. In the early days of telecom and the Internet, as fundamental technology was being invented, it was imperative for the growth of the new markets that standards were 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 to market needs.

However, the maturation of the Internet as an application platform and the related rise of Internet-enabled device and service providers, especially on the Web, have helped renew a focus on innovation and differentiation. The result is a more complex market that is evolving ever faster, as we approach the future in which all communications will be Internet-based. The future of telecom 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."

Standardization provides benefits to the mobile 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 mobile value chain, allowing insight into the entire system architecture. Without this, pieces of solutions coming from multiple vendors are unlikely to work together. Third, historical standards such as MMS or 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 our complex system of reliable, interoperable mobile voice and data networks and services across the planet. As these wireless networks are evolving toward an all IP infrastructure, 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 1.6 million apps available for Android alone, 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 ensure integrity and interoperability in the network or service layer. When the work is complete, SDOs typically produce a document, often in PDF, that is published for the industry at large to absorb and adhere to when developing their products or services. SDOs often operate using Fair, Reasonable, and Non-Discriminatory (FRAND) or Reasonable and Non-Discriminatory (RAND) licensing terms to protect the Intellectual Property Rights

(IPR) contributed to the specifications.

Application developers are concerned with creating applications that take advantage of these standards. They work with socially connected tools that allow for co-opting, adapting, and republishing their work and the work of others, under one of many Open Source licenses that generally allow for reuse, adaptation and productization of work on a royalty free basis without the need to negotiate terms with each contributor or contributing company. Developers operating in an Open Source community can find themselves at odds between the Open Source licenses adopted by their community or project and the FRAND or RAND-based licenses required to use specifications produced by the SDOs.

The Survey

In 2014, the Open Mobile Alliance (OMA) began a series of initiatives to begin to bridge the gap between the needs of SDOs and the needs of the developer community. Over the last 18 months, it became clear to OMA that improved interaction with Open Source initiatives was on the list of important developer needs, but just how important this would be to the mobile and Internet of Things (IoT) industries moving forward was not completely clear. Therefore, in March of 2016, OMA launched an industry survey to find better data about how traditional telco-oriented companies are approaching Open Source and conversely how the Open Source community views the need for interaction between SDOs and Open Source organizations.The survey was distributed broadly across OMA's marketing database and social media: 419 individuals responded to the survey representing over 300 different companies, universities, governmental organizations, standards bodies and Open Source communities; 22 percent of respondents were from OMA member companies. When asked to indicate their company's primary business, 29 percent indicated software developer, 12 percent indicated mobile operator, 10 percent indicated mobile device vendor, 9 percent indicated network equipment vendor and 40 percent indicated "other". Of the "other" category, the most often cited primary businesses were government agency, university and semiconductor/chipset supplier.

It was important to begin the survey by getting agreement on the definition of Open Standards and Open Source Projects. Ninety nine percent of respondents agreed with the following definition for Open Standards: "Open Standards are best defined as documents made available to the general public, which are developed (or approved) and maintained via a managed, collaborative, transparent, and consensus-driven process. Open

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Standards facilitate interoperability and data exchange among different products or services and are intended for widespread adoption." Ninety eight percent of respondents agreed with the following definition of Open Source Projects: "Open Source projects are best defined as programs in which the source code is available to the general public for use and/or modification from its original design that is made available under an Open Source license. Open Source code is typically created as a collaborative effort in which programmers improve upon the code and often share the changes among the programming community for such projects. At a high level, Open Source licenses allow users the freedom to use, modify, and distribute the source code without requiring any further permissions."

Having set baseline definitions, the survey went on to ask a series of questions regarding current and planned participation in Open Source Projects as well as attitudes towards the need for cooperation between Open Standards and Open Source. Eighty six percent of survey respondents indicated that their organization was either maintaining or increasing their participation in Open Source organizations while only 2 percent indicated they were decreasing participation.

More than 75 percent of respondents felt that Machine-to-machine/IoT products and implementations will rely heavily on Open Standards and over 60 percent felt that these products would also rely heavily on Open Source implementations. When asked the same question about next generation telecom network products, nearly 70 percent felt they would rely heavily on Open Standards and nearly 50 percent felt they would rely on Open Source.

Respondents were then asked, "In the scope of telecom services deployment, what do you think will be the dominant trend in the next several years?" Over 80 percent indicated that Open Source implementations of Open Standards specifications would be the dominant trend.

However, when asked if they believe that RAND based specifications can be successfully implemented into Open Source projects, 64 percent either said "No" or "Not Sure". Complexity and incompatibility of licensing terms was most often cited as the biggest hurdle to overcome.

These last three questions indicate a dominant industry trend towards products and services based on Open Standards and Open Source, but also reservations as to whether this can be achieved within the same product. This presents a challenge and a call-to-action for the SDOs and the Open Source communities who will be involved in the definition and development of these products and services. Eighty percent of respondents felt that the Open Standards community would benefit from a closer relationship to the Open Source community, stating that early Open Source implementations of standards can provide important feedback and help with proliferation of a standard. Conversely, 77 percent of respondents felt that the Open Source community would benefit from a closer relationship to the Open Standards community, stating that Open Standards can help Open Source projects with overall architecture and system design considerations, quality, interoperability and roadmap.

As the results of this survey show, Open Source software is a growing trend in the next generation mobile and IoT industries and standardization will continue to be the foundation on which interoperable products and services are built. The vitality of the wireless ecosystem demands that the standards development community and the Open Source community bridge the gap in work practices and deliverables to ensure efficiency and interoperability across the mobile value chain.

Survey details can be found at www.openmobilealliance.org.