

13 March 2017

Via email to: iotrhc2017@ntia.doc.gov
National Telecommunications and Information Administration,
U.S. Department of Commerce,
1401 Constitution Avenue N.W.,
Room 4725, Attn: IOT RFC 2017
Washington, DC 20230

Re: InterDigital Response to NTIA Request for Comment on Department of Commerce Green Paper: Fostering the advancement of the Internet of Things

Dear Sir/Madam,

InterDigital, Inc. ("InterDigital") respectfully provides its comments to the NTIA's Request for Comments on the Green Paper: Fostering the Advancement of the Internet of Things, dated January 12, 2017.

The NTIA's Green Paper discussion of the IoT accurately captures current industry sentiment as to the challenges, benefits and potential role of government in advancing the adoption of IoT technologies. The Department's resulting plan of action covers a wide range of disciplines and industry issues, out of necessity.

Our suggested enhancements address matters of approach, to optimize the plan's effectiveness. We also comment on the Department of Commerce's strategic vision which should seek to learn from and leap-frog the early stage implementation experiences of IoT pioneers in international markets.

Enhancing the Department's proposed approach

We assume that the Department's proposed approach makes the best use of available resources and opportunities to overlay an IoT complexion on other ICT initiatives that are already underway. The Department should nevertheless explore ways to amplify the impact of its own undertakings by leveraging private-public partnerships and private-sector initiatives (e.g. industry alliances such as the Industrial Internet Consortium which is driving educational and standardization agendas for the industrial IoT).

Market education across a broad range of topics will be particularly important to alleviate the uncertainty and hesitancy that many organizations face when contemplating the complexity of IoT solutions. For example, it is highly likely that many IoT design decisions, technologies and solutions will be unfamiliar to city administrators, hospital managers, manufacturers, utility operators and other IoT users. The

Department can reduce uncertainty for American government and industry users through education and knowledge transfer initiatives.

A reference example of this is the India-EU Cooperation on ICT-Related Standardisation, Policy and Legislation project¹. This project involves two standards development organizations ETSI (Europe) and TSDSI (India). As part of a multi-year plan, they host a range of activities. One of these is a workshop on smart cities, an important segment of the IoT market opportunity. The workshop will focus on IoT standards and their application in the smart city context. It will act as a forum to exchange experiences between European and Indian smart city representatives and involve a variety of public and private-sector organizations, technology suppliers and city administrators.

This type of initiative is beneficial to market adoption through mechanisms such as global standardization and knowledge transfer. Global standardization enables massive economies of scale. This lowers development costs and improves affordability to accelerate adoption, as evidenced by the success of the cellular industry. Similarly, knowledge transfer reduces business, implementation and technology uncertainty which are sources of friction in the adoption process for IoT solutions. The US should seek to be a part of the international standardization dynamic, from an early stage, to capitalize on the resulting economic benefits.

Learning from early-adopters to set the Department's strategic vision

The Department's plan needs to maintain a balance between near term priorities (e.g. technology, privacy, security challenges etc.) and longer term enablers of widespread adoption, including ideas to foster large scale change-management in multiple industry sectors.

To illustrate the balance between near- and longer-term objectives, we draw the Department's attention to the oneTRANSPORT^{TM2} initiative where InterDigital is involved with ten other public and private sector organizations to pilot an IoT solution for multiple intelligent transport and smart city applications.

The early stages of the project addressed the challenge of connecting multiple assets and sensors to gather transportation data belonging to four contiguous county authorities in the UK. Their data is aggregated in a virtual, data exchange which is accessible to application developers, on commercial terms, to build a range of journey-planning IoT applications. This arrangement has the benefit of linking data producers (i.e. local authority and highway owners of transportation assets) to data consumers (IoT application developers and their end-user customers), allowing each group to focus on their domain of expertise.

The project addresses two categories of IoT use cases. The first corresponds to the implementation of simple IoT applications, such as multi-modal journey planning. The second addresses longer term value creation opportunities in the form of data monetization use cases and the associated innovations in business-models. As such, the oneTRANSPORTTM trial is a learning opportunity for other organizations

¹ <http://www.indiaeu-ictstandards.in/upcoming-workshop/> - Workshop on "Future Proof Smart Cities with a common services layer: a standards driven approach", New Delhi, 21 April 2017

² http://onetransport.uk.net/project_outline/ - oneTRANSPORTTM is a collaborative research and development initiative that extends the smart city concept to enable local authorities and transport operators to enhance their transportation services using a combination of data sharing and an innovative business model, thereby unlocking new external financial resources and their own underutilized transport data.

to become smarter in their adoption plans by looking beyond first-generation IoT use cases to longer term sources of value in the digital economy.

In the context of sector-wide transformation, another important element of the project was the creation of a change management framework. This encourages other local authorities to initiate deployments in their own localities, creating market scale and industry momentum. To this end, the oneTRANSPORT™ initiative established a forum - The Transport Data Initiative³ (TDI) - for local authorities to meet and exchange information about implementation challenges and successes. As a measure of its success, the first meeting attracted local authorities representing 40% of the population in England. Building on this critical mass of interested parties, the subsequent meeting attracted additional new participation⁴ from many other regions across England and Wales. The customer and end-user focused aspects of the TDI framework could well become a model for the Department to replicate in key sectors of the US market.

Now that the oneTRANSPORT™ project is 18 months into trials activities, there is a considerable body of empirical evidence about private-public partnership models, business model innovation and technology solutions. These are some of the critical enablers that surround core IoT technologies and which account for successful and sustainable patterns of adoption. oneTRANSPORT™ and the TDI provide a whole-system reference case. There are likely to be other examples whose deployment experiences could be replicated in other segments of the IoT market in a manner that informs US organizations and accelerates their adoption of the IoT.

Next steps for the Department

An important next step for the Department is to formalize its proposals in the form of a 3-year action plan and a corresponding set of tactical and strategic outcomes. This would reflect the multi-year nature of the IoT market, backed by a suitable level of resource commitment from the Department, and provide planning guidance for private sector partners.

A suggested framework would entail the following:

- a 3-month period of community building to identify and categorize interested parties based on their expertise, needs and willingness to collaborate substantively with the Department.
- a subsequent 3-month period of work with partners to formalize a combined action and resourcing plan. The core of this plan would include reporting milestones where the Department could promote the outcomes of its internal plan of action.
- a 30-month implementation phase, with 6-monthly showcase events to reconvene participants and publicize major accomplishments. Ideally, these would be timed to coincide with major IoT industry events through partnerships with trade associations and IoT event organizers, for example.

³ <http://transportdatainitiative.com/> - The Transport Data Initiative is led by commercially minded local authorities (in the UK) whose aim is to improve the way their transport data is utilized and in turn improving the cost of delivering transportation solutions targeting the needs of local citizens.

⁴ <http://transportdatainitiative.com/events-archive/tdi-forum-attendance-map/> - TDI Forum attendance map

The value of such a plan is in providing industry partners and other governmental bodies with a roadmap against which their own resources could be earmarked for planning purposes. Such an arrangement would provide much needed focus to international collaborators and US industry. It would also ensure that resources are marshalled effectively in providing momentum to advance the IoT.

In conclusion, we reiterate the importance of public-private sector collaboration and the learning value of insights from other international developments. Contributions based on a global perspective of the IoT market, best practice ideas and important industry dynamics are certain to benefit domestic organizations and the pace of IoT adoption in local markets.

InterDigital appreciates the opportunity to comment on the NTIA's review and we look forward to working with the Department in executing its plan to accelerate the adoption of the IoT.

Respectfully submitted,



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