

Answer to the European Commission public consultation on the early challenges regarding the "Internet of Things"

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Response to the Opinion of the EESC on The Internet of Things

Submitted by:

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1. Do not try to make rules for everything in advance

The EESC statement may place too much emphasis on making rules *in advance* of the technology's development. This can harm development and stifle innovation. By forbidding things beforehand it is possible that certain paths will never be traveled, no matter what great new technologies and products might be hidden alongside it. Rules and regulations set in place well in advance of any operational technology are likely to target problems that never appear, and yet unintentionally create barriers to activities that are good, but not anticipated. Advance frameworks may also completely miss the real problems that do develop. This does not mean that legal and policy problems should be ignored. First, one needs to maintain a commitment to basic rights at the general level, such as individual privacy rights, freedom of expression, and consumer protection. One must then carefully monitor how those general principles are impacted in concrete situations if and when new technical systems emerge.

2. Leave space for emergence

This point is related to the first point, but draws on our historical experience with the Internet. The TCP/IP Internet was successful precisely because it was an emergent phenomenon. Its development, use and application were not constrained by pre-existing, heavy governance schemes around telecommunications, intellectual property, broadcasting and media. Instead, the Internet was able to grow in its earliest stages unhindered by new laws and the bureaucracy that usually goes with them.

3. Operational technology leadership often translates into governance leadership

Those who took the lead in developing and using the Internet were in a position to set de facto rules and structures in place regarding how it eventually was governed (IETF, IANA, Regional Internet Registries, ccTLDs, etc.) As the need arose for regulation and standards, Internet operators and network engineers themselves were in a position to establish procedures and rules, instead of wanting or needing their governments to do so.

4. Integrate researchers, developers and users

When contemplating support for an *Internet of the future* or *Internet of things*, bear in mind that one of the key factors making TCP/IP a success was the complete integration of the researchers and standards developers with the users of the emerging internet. TCP/IP won out over OSI in large part because the *developers were the same people as the initial users*. The emphasis was on running code, and the developers were in a direct position to know whether the code ran or not. Therefore, if Europe wants to take the lead in the development of Internet of Things it should focus on integrating research with actual operational deployments *and* uses. Radical new ICT technologies such as Internet of Things will be defined and shaped by primarily by the people who deploy and use it in real applications. Those applications have to solve real problems or meet actual societal needs first and foremost. Until that happens we have only a very limited idea of what the real policy problems are and how to respond to them.

5. Be the first to standardize new IoT applications

Right now it is evident that IoT developments are being driven by a single application, which links electronic product codes and RFID tags to supply chain management functions. Within this specific application domain, the strategic resource is neither the Internet *per se* nor the RFID tags,

but the electronic product code (EPC) standards that define what information is on the RFID tags. One strategy for altering the future of IoT is to conceive of new, different Internet-of-things applications and to develop new, open standards that are based on the assumption of some other use besides product movements among trading partners. (The EESC statement is correct, of course, that any applications that involve humans rather than physical objects must conform to a different set of standards and constraints.)

6. Look forward, not backward

The emphasis in the statement on “political governance of the Internet” (3.1.2) seems misplaced, or at least not well formulated. One cannot obtain a leadership position in new, innovative applications by focusing one’s attention on asserting political control over existing infrastructures. Of course Europe must make sure that new applications and systems are not hampered by the governance structures of old institutions. In that regard, it is important that the root of an object naming system (ONS) of an internet of things not be inextricably bound to the governance arrangements surrounding the DNS root controlled by the U.S. government. But this result can be achieved more gracefully and effectively by developing applications and organizations that bypass such dependencies. This is better than engaging in some hierarchical inter-state battle, and better than asserting some kind of national control over ONS roots. Indeed, such politicization of the next-generation Internet would almost certainly slow down if not stop innovative developments, by locking Europe into a top-down, advance regulation approach designed to maintain control. This will only divert its attention from fostering a creative, pro-active approach oriented toward developing new capabilities.

7. Don’t fight the last war

Following up on that last point, many of the policy problems hinted at by the EESC statement seem to assume that an internet of things will instantly be globally and universally interconnected and as open as the Internet of email and the Web. It is quite possible that this assumption is unrealistic. Some realizations of the Internet of Things may evolve as a localized application, or be composed of the voluntarily connected private networks among organizations. Universal interconnection of these systems may not be something Europe wants to mandate or encourage. While the power and economic benefits of universality are evident, universal scope is also associated with many of the potential dangers and worries associated with IoT, such as privacy and security problems. By promoting and encouraging a more bottom-up, heterogeneous and patchwork approach, and developing standards and practices for flexibly responding to such heterogeneity, Europe might prepare the way for a different future.

8. Support open standards

The Internet’s success is related to the use of open standards in its protocols and software. This has allowed a variety of vendors, developers and hardware manufacturers to come with their own solutions to the market and sell them. In return, this has heavily increased competition and innovation within the market and pushed it forward at great speeds.

9. Use open spectrum policy to promote IoT innovations

Another area for policy initiatives might be in spectrum policy. Bands of unlicensed spectrum for fostering the development of IoT might be set aside for partnerships of Internet service providers, researcher-developers, and prospective user groups to experiment.

(Version 2.0, 25 November 2008)