ICT Competitiveness Week

Smart Cities Plenary Session Report

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Introduction

Given urbanisation trends, on-going transformations towards increasingly knowledge-intensive economies as well as their growing share of resource consumption and emissions, cities are becoming even more of a focal point for our economies and societies at large. To meet public policy objectives under these circumstances, cities need to change but in times of tight budgets this change needs to be achieved in a smart way: cities need to transform themselves into 'smart cities'.

Strategic deployment of ICT applications and infrastructures is one of the most important levers in this process. Indeed, ICT solutions can help realising a vision of smart cities that lives up to the demands of a 'triple-bottom-line' sustainability strategy: optimised resource usage and emissions footprint; economic growth through flexible, enabling infrastructures and services; and greater social inclusion, citizen engagement and responsiveness.

Yet, to avoid mistakes reminiscent of the 1950s and 60s top-down command city planning, it is essential, at a time when Europe is speeding up its efforts towards the development of smart cities (cf. the launch of the European Innovation Partnership "Smart Cities and Communities" this July), that the right questions are asked so that impediments are identified and no new ones are created. To this end, a plenary session on smart cities was held during the ICT Competitiveness Week (17 to 20 September 2012). The overall aim of this event was for ICT stakeholders to help the European Commission to shape and validate the new ICT Research and Innovation Strategy that will eventually be implemented in Horizon 2020 as well as DG CONNECT's policy activities.

The session on smart cities focused on generating discussions that would enable the identification of key success factors for European cities and the European vendor community and leading to specific recommendations for stakeholders. To facilitate discussions, six invited panellists were asked to make opening statements, with each speaker addressing a specific predefined question addressing issues of direct relevance to the work of DG CONNECT. Details on the invited speakers as well as the questions are included in an appendix.

This report presents a summary of the discussions that took place, which provide the justification for the key success factors that are subsequently listed. Where appropriate these success factors are linked to horizontal themes discussed on the opening day of the ICT Competitiveness Week. The key success factors in turn lead to a number of recommendations for the various stakeholder groups.

It should be noted that this was a discussion of external experts and stakeholders and that therefore the views and recommendations expressed in this report do not necessarily reflect any official position of DG CONNECT.

Summary of Discussions

Urban populations are growing, as are the ICT infrastructures needed to support them, and this trend is expected to continue, so it has become clear that the energy challenges of the early 21st century, and the associated greenhouse gas emission issues, will, to a large extent, be won or lost in our cities. In addition, there is the challenge for cities to remain attractive given that they can become places where crime, noise, poor air quality, etc. render them unattractive, both to individuals and businesses. To remain appealing,

and thus centres of economic activity, all of these potentially damaging elements need to be tackled. Hence the nature of smart city challenges are varied and complex. Impediments to achieving smart cities are also complex and encompass many areas, including technical matters, financial and economic issues and associated questions of how to clearly quantify benefits of such solutions, as well as the nature of the approach towards development and implementation.

Technical Matters

While most cities share a set of common features and needs, cities are at the same time all different. Thus while development of transferable ICT solutions is clearly desirable (to reap benefits of economies of scale and faster progress on learning curves), the uniqueness of cities will also have to be taken account of. It was suggested that the 80/20 rule might apply, at least in the domain of infrastructure and its associated challenges, with hence 80% of solutions being transferable across the European cityscape. Alas, the evidential basis is, for the moment, only the experience of some market actors. Developing an understanding of what will be common, and will be unique, is important to success, as is ensuring that both dimensions are considered.

Avoiding vendor lock-in that could result from the use of proprietary standards is also essential and this requires a city's administration having developed a clear smart city strategy and taking on leadership in working with vendors on the implementation thereof. To be successful, cities need to exchange and learn from best practices and from reference models and standards, some of which already exist and some of which clearly require further work. Further, architectures of smart city solutions should go beyond, and not mirror existing silos in cities' administrations. It was suggested that the work undertaken in the context of the City Protocol, a recent initiative of cities, companies and associations in which also the European Commission takes part, will prove helpful in this regard.

Open access to pertinent data (within the limits of ensuring citizens' privacy), from the public sector and beyond, will also be essential to among other things, help remove innovation and market entry barriers. Interoperability among different applications, as well as across different vendors' solutions, is equally vital for fully realising the benefits at city level in terms of optimised outcomes and better decision-making.

Metrics, Financial, and Economic Issues

It was noted that at the present time the smart cities market does not move sufficiently fast to sustain private sector interest and hence investment. Actions to stimulate the market would hence seem fit and should focus on creating a customer base that does not now exist for a large part. To address this risk, ICT vendors need to work together with other sectors (such as utilities) and in close partnership with cities and local businesses to align their business strategies with cities' actual problems. One way to do this in practical terms might be to consider a competition-oriented approach that is being pursued by the UK government, where Member State funding is provided for cities to develop smart cities project plans, with the winner receiving full funding to take the project forward.

That there is a high rate of pilot projects terminating once public funding ends is a clear fact. This suggests that an essential task is ensuring longer term financial, to ensure the continuing interest and support of the involved stakeholders. For the public sector the best way to ensure this may be pilots that deliver a clear overall cost saving for the city

budget. For the private sector the pilots must eventually lead to a RoI. One way to deliver these financial gains, may well be not to focus on developing big platforms, but to address the solutions to specific well-defined problems in a given city. Measuring the project outcomes is, self-evidently, also an important requirement and in this context it is important to stress that outcomes, rather than inputs, is what any performance indicators should be based on.

Nevertheless, there remains also the question of who will pay. Reality is that increasingly it may be necessary to charge citizens for services that presently they receive free-of-charge at point-of-use. Some new services that will arise from smart cities may hence have to be delivered on a *pay-as-you-use* basis. This implies making these services much more efficient and consumer friendly, adopting where appropriate the self-service paradigm. This suggests also a bigger role for the private sector, and hence opportunities for (ICT) vendors to turn more into B2C service providers.

Implementation Approach

Achieving clarity in the roles of the different stakeholders is essential. To be kept in mind is that ICT vendors cannot have the kind of insight into how cities work and their specific features that cities' administrations do have; an activist role for cities and leadership in the implementation is therefore appropriate. The top-down planning that is associated with some forms of ICT project management may not always be suitable. This could lead to type of thinking that was characterised by some session participants by the phrase "*We have a hammer, so let's use it*." There may be circumstances where the hammer should not be used, or used only in specific ways.

Mobile devices and the applications that run on them have a potential to change behaviours and provide information to optimise service delivery. Mobile devices can obviously provide access to information in a great many ways, or deliver services, or increasingly, act as sensors or interfaces to sensors (broadly understood), as well as IoT building blocks. However, data privacy is a limiting condition; also the potential for behavioural change can only be realised through involvement of and engagement with citizens as users (e.g. through feedback mechanisms or enabling self-organisation amongst users).

To assist with the implementation of smart cities, IT tools (e.g. 3D visualisations) could prove to be beneficial so to organise data into proper information, accessible also to non-expert political actors, on which cities may base their smart city strategies. Such tools could also be important for engaging the interest of citizens and stimulating their role in co-creating solutions.

The matter of engaging citizens as well as local (micro) SMEs is widely seen as important, but not just in the context of requirements engineering and validation phases. Citizens and local businesses are themselves sources of innovation (e.g. the citizen as application developer), as well as key in optimising eventual uptake.

To aid with this, cities may need to begin to shift away from initiating developments, to creating the frameworks that will facilitate others to start such developments. To this end the idea of open data repositories is an essential element and might well prove to be a treasure trove for innovative local (micro) SMEs in the ICT sector. This whole philosophy is also well aligned with the notion that cities no longer have the financial resources to do everything themselves – people might need to begin, once more, to help

themselves, their neighbours and their communities. This could also enable not only a bottom-up approach, but a *start small and then grow* methodology, with higher scale solutions being built on smaller local ones.

Key Success Factors

The above considerations point to the following key success factors:

- Joint solutions involving several sectors (ICT, building and construction, energy and transport), joint investments/exploitations will need to be developed; related: better access to finance for local SMEs *(see also Day 1 Them 'Innovative Companies')*

- Focus on solutions that are transferable across cities and make city administrations move beyond administrative silos in their implementation;

- Use and develop open standards, at least for data but ideally also at deeper levels; ensure interoperability;

- Address cities' financial problem – solutions must save them money; as well as possibilities for profits for the private sector - achieve a RoI;

- Use output-based KPIs for measuring Smart City solutions (ideally spanning the financial, economic, environmental and social dimension);

- Citizen and business involvement that moves beyond requirements collection to co-creation.

Recommendations

The key success factors in turn lead to the following recommendations:

- Commission/Cities: work on KPIs to enable cities to measure Smart City outputs (ideally spanning financial, economic, environmental and social dimension).

- Cities: Enable local businesses and other interested partners to work together to develop new applications and services (beyond e-gov) rather than doing this yourself top-down; foster open data repositories.

- Vendors/Cities: use an approach that ensures relevancy, e.g. by focusing on specific problems as starting points, but regarding these as part of a platform; co-develop with citizens and local businesses.

APPENDIX

Questions addressed by the panellists to initiate the discussions:

- How to balance transferability of solutions (and thus greater scale-up opportunities, lower unit costs etc.) with the variations in the European cityscape, both, in terms of urban/demographic variation and in terms of an administration's financial and management potential? Is there room for *smart specialisation*, drawing on local SMEs?

- In what domains in the operation of smart city solutions do adequate data standards already exist and in which others do they still need to be created (so as to reap the related benefits of avoiding vendor lock-in, improving analytics, etc.)? What other strategies and concrete instruments can a city administration draw on to prevent vendor lock-in?

- How to turn mobile devices and mobile apps into key drivers of behavioural change towards more sustainable behaviour and consumption? What kind of data and what kind of skills on the part of citizens would be key for this?

- How to better connect (multi-)national vendors and financiers with local SMEs, administrations, and citizens in order to realise smart city ecosystems in Europe's cities (that provide the right conditions locally for faster deployment of smart city solutions)? And, what sectoral silos, if any, still need to be overcome towards this end?

- Are there unique strengths of the European vendor community that can be leveraged to the global smart cities market? What should be the European vendor community's focus so as to maximise growth of market share: developing specific point solutions or grand platforms (if this is a valid dichotomy at all)?

- How to avoid that pilot projects that die once public money no longer flows, but achieve the scale-up we need instead? How to ensure early on that the underlying business models are economically viable enough to survive on their own? And how to make these pilots *measurable by design*, i.e. deliver reliable, quantified Key Performance Indicators (KPIs) (also for substantiating marketing efforts at exploitation stage)?