Orientation paper: research and innovation at EU level under Horizon 2020 in support of ICT-driven public sector innovation

10 May 2013

Contents

1 Introduction

This orientation paper is compiled from expert discussions and inputs made during and after a workshop on 31 January 2013 in Brussels, together with an online public consultation between 8 March 2013 and 15 April 2013. It provides a clear vision of ICT-driven public sector innovation seen from the point of view of the stakeholders, and proposes measures to be undertaken during the first Work Programmes of Horizon 2020, 2014-2015.

Apart from this introduction, the paper is divided into three sections drawing on the previous work:

- Vision for ICT-driven public sector innovation
- Proposed measures related to drivers and trends
- Proposed measures related to basic technology tools and other enablers

In addition, there are two annexes comprising the Expert Workshop Report and the Report of the Online Consultation.

2 Vision for ICT-driven public sector innovation

The vision for ICT-driven public sector innovation refers to the use of Information and Communication Technology (ICT) for the creation and implementation of new and improved processes, products, services and methods of delivery in the public sector. These result in significant improvements in the efficiency, effectiveness and quality of public services as well as in the wider operations of the public sector. In addition, the vision refers to the ability of the public sector, as appropriate to its mandate and resources, to become more innovative and responsive to society's needs in the way it operates. It also sees the public sector supporting innovation in wider society by providing an appropriate collaborative environment and enabling conditions.

It will only be possible to fulfil such a vision by adopting an open governance approach, enabled by ICT, which encompasses open structures, open organisations and open processes. This involves breaking down, or at least cooperation between, the 'silos' represented by different administrations, levels and locations, through sharing infrastructures, processes, data, assets, resources, content and tools. It implies forms of federation and coordination which balance centralisation and decentralisation as well as top-down and bottom-up approaches. This poses significant challenges technically, politically, legally, organisationally and in terms of working cultures. The vision encompasses a 'whole-of-government' approach in which the public sector in many ways acts as one entity, especially in its interactions with other actors including citizens and businesses. Such a vision can only be realised through the enabling power of ICT, but it is a vision ultimately framed by society's needs rather than its technological components.

The public sector is normally considered to be the main if not the only creator of 'public value´. This is here defined as goods or services which can be used or shared by many individuals or groups, and which other actors (including individuals themselves, civil organisations or the private sector) cannot or will not provide, or cannot provide as efficiently or effectively as the public sector. However, the vision also implies that government should create a platform for collaboration as an open environment with clear frameworks, guidelines, resources and supports which invite all legitimate actors to collaborate in producing public value. The vision considers everyone as a potential resource for public value with assets to contribute on their own terms. Government's role is to facilitate the growth of ecosystems of actors which enable this to happen in a balanced and transparent manner.

In changing and adapting the roles of government in this way, there are also real concerns that such changes will result in new types of risk, for example:

- Loss of control and blurred accountability of services (by whom to whom?)
- Service quality standards are more difficult to determine and maintain with many designers and suppliers
- Privacy and data security
- Danger of data and content mis-use
- Digital elite formation – new digital divides?
- Information and data overload – or is this more a filter failure?

However government, as the only institution legitimised by democratic accountability, is best placed to address these risks and will need to retain basic roles including setting overall quality standards, providing mechanisms for resource sharing, and determining legal frameworks.

3 Proposed measures related to drivers and trends

3.1 Open government and open governance

Open government is one of the main pillars of ICT-driven public sector innovation based on open data, open services and open participation (see below). However, for this to be realised, a broader open and collaborative governance framework, encompassing structures, organisations and processes, is also necessary based on the principle of open by default. Research measures should focus on the use of ICT to:

- Develop frameworks and models which both link across many parts and levels of the public sector as well link to other appropriate actors outside government, for the specific purpose of creating public value.
- Increase the efficiency and effectiveness of the public sector, and thereby public value, through sharing and pooling public assets, resources, data, infrastructures, processes, service components, content and tools, and thereby reduce waste and duplication.
- Create whole-of-government models and frameworks which are by nature simpler for the user, user-centric, personalised and personalisable, highly fulfilling and flexible.
- Support the legal, structural, organisational and human factor changes necessary to achieve open governance, and reduce the barriers to these, whilst retaining the privileged position of the public sector as determined by its specific mandate and resources and legitimised by democratic accountability.

3.2 Government as a broad platform for public value creation

Although the public sector can create public value on its own, its potential to do so is greatly enhanced through cooperation with other actors, or by enabling other actors to do so independently. Although not appropriate for all parts or roles of government, government as a ‘platform’ means it creates an open enabling environment with appropriate tools and resources designed to act as a ‘launch-pad’ for the broader creation of public value. Existing and new ICT is transforming the ability of government to act in this way. Research measures should focus on the use of ICT to:

- Create a broad platform for collaboration across government and with dynamic ecosystems of other actors like companies, SMEs, civil society organisations, communities, groups and individuals, as well as with hackers, designers and artists, in order increase the potential for innovation given that government does not have a monopoly on relevant assets or knowledge.
- Ensure that appropriate government resources, such as data, applications, knowledge, content, capacity, guidelines, standardised functional modules and service building blocks, are complemented by those of other actors, through for example hackathons, fora, blogs,

consultation, advice, guidelines, brokerage, good practices, arbitration, workshops, events, etc.

- Focus on three ways in which government's role changes when acting in this way: first, by providing guidelines, incentives and resources for broad collaboration and co-creation; second, by managing and orchestrating its own assets together with assets contributed by other actors in a transparent, fair and accountable manner; and third, by ensuring sustainable and balanced public value through quality standards and a fully inclusive and long term approach which reduces risk.

3.3 Open services and new service approaches

Public services delivered or enabled by ICT need to focus increasingly on openness, user empowerment, co-creation, service personalisation, simplicity and needs fulfilment. Important drivers include learning from the best in the private sector, and balancing the 'digital by default' principle to increase the efficiency of government with ensuring that all users are served using appropriate channels and that their privacy and integrity are protected. Research measures should focus on the use of ICT to:

- Maximise the efficiency of statutorily determined services through administrative burden reduction approaches including automatic, personalised and simple transactions which are both data and intelligence-driven.
- Open up service design and deployment to co-creation with users and other actors through co-creation platforms, open data and other resources, given that users are the experts in what their problems are as only they possess the fine grained knowledge about what they really need, within an accountability framework.
- Support the development of 'everyday', 'smart-city', local, and location-driven services, based on open data and mobile devices using GPS as well as web-based services, so that services are offered or created depending on where users are, as well as who they are and what they are doing.
- Develop interoperable digital repositories for public services, for example with services and service components in the cloud, and which enable automatic web-service discovery of the components users need and which can be composed, for example, on a personalised citizen dashboard.

3.4 Open participation and engagement

Most e-participation research and practice over the last ten years has focused on the use of ICT for citizen involvement in political decisions and public policy making. This remains very important, but an ICT-driven open engagement vision goes wider aiming to re-calibrate the balance of power between citizens and government to increase transparency and accountability and improve governance processes. Research measures should focus on the use of ICT to:

- Enable widespread collaboration in service strategy development and design decisions.
- Open up the organisational structures and work process arrangements of the public sector and public governance for wider involvement and inputs.
- Participation in managing public assets, such as land, buildings, finances, etc., for example through participative budgeting.
- Improve community building, dispute and conflict resolution, planning and land use decisions.
- Enhance public policy and decision-making as part of the overall democratic process.

3.5 Experimentation and bottom-up innovation

New forms of ICT-enabled open, bottom-up, evidence- and impact-led innovation, as well as social innovation, can be supported by the public sector. These forms recognise that everybody and every group are potential innovators but this often needs to be better enabled and coordinated in order to have maximum effect. The public sector can create the conditions and provide resources for bottom-up innovation arising from large numbers of experiments on a

scale where failure is small and early and thus survivable, and where success can be supported and scaled. Research measures should focus on the use of ICT to:

- Enable public sector support for small-scale and bottom-up societal experimentation in order to maximise the impact of social innovations.
- Collaborate in, and facilitate the development of, appropriate tools and resources for bottom-up and social innovation, such as societal incubators, living labs and open public labs, data and data analytics, etc.
- Undertake open policy experimentation in support of evidence-based policy development and deployment using scientific tools including ethnographic research, randomised controlled trials, etc.

4 Proposed measures related to basic technology tools and other enablers

4.1 Infrastructures and processes

In order to enable the above trends and visions, ICT is needed so that governments can engage the world outside and well as link up inside in order to create public value, especially in relation to infrastructures and processes. Vendor and technology independence and the collective power of smart public procurement should be promoted. The public sector should combine and build on basic technological elements developed elsewhere by distinguishing the research already done from new adaptive research needed by the public sector. Research measures should focus on:

- Adopting and developing the new types of infrastructure needed in a public sector environment which is both connected up inside as well as connected to the world outside. Public value is enhanced by the ability to share, interact and collaborate between actors using common, interoperable and open infrastructures.
- Adopting and developing the new types of coherent end-to-end 'big processes' needed to meet these needs whilst retaining the ability to support decentralised innovative operations, and move rapidly to seize opportunities enabled for example by 'big data analytics'.
- Addressing two strong organisational trends which interplay to produce both economic and public value: the trend towards self-managed performance cells in organisations, and the trend towards loosely-coupled multi-organisational collaboration networks. These trends offer huge innovation potential for government.
- Adopting best practice frameworks for public technology management and the use of reference models for ICT and standards, including where beneficial open standards and open source.
- Deploying, as appropriate, advanced cloud solutions, semantic interoperability, web 3.0 approaches and the Internet of Things to improve the efficiency and effectiveness of public sector operations, for example cross-border open data and cloud-based services.
- Increasing the focus on web 2.0, social media, gamification, mobile solutions and BYOD, including promoting the development of ecosystems of public sector apps, as part of government's open, engaging, transparent and collaborative vision.
- Continuing to develop and deploy privacy-enhancing-technologies which ensure data protection, cyber security, identity management and authentication.

4.2 Open data and big data

A transformatory new source of innovation is open public data, made available in machine readable linked datasets which can be easily searched and mashed. To date only a few governments have substantially embarked down this path, and even fewer local and regional authorities where the benefits are likely to be greater. There are numerous sources of big data including open data released by the public sector; physical environmental data for example from sensors and the Internet of Things; data from social networks and co-creation platforms;

crowdsourced data including preferences and opinions; as well as data from businesses and civil organisations. Research measures should focus on the use of ICT to:

- Develop and enhance standards for data quality, structuring, linking and searching, as well as standard tool modules for compilation, analysis and visualisation, in order to boost the demand side for open data and assist in developing user ecosystems which contribute to public value creation.
- Provide safeguards for ensuring the provenance, integrity, auditability, authenticity and transparency of data, but also use data release to improve overall data quality and completeness.
- Deploy open and big data in a balanced and inclusive manner for public value creation, for example in service co-creation and public policy and decision-making, as well as for personal and private value benefiting individuals or groups of citizens and businesses through for example smart disclosure.
- Couple big 'hard' data with 'soft' data and qualitative approaches in developing public policy which align with European ethics and values.

4.3 Policy modelling and making

It is important to build on the FP7 research on ICT for governance and policy modelling undertaken since 2009. In learning from and continuing this work, research measures should focus on the use of ICT to:

- Develop common public sector tool boxes for big data analytics to address complex societal problems using evidence-based iteration and feedback, including the use of crowdsourced and other data to model and develop appropriate decisions and policies, as well as implement and monitor them.
- Investigate the role of massive multiplayer policy gaming, simulation and model-based decision-support systems.
- Facilitate the development of the user and demand side, for example through intuitive user dashboards and visualisation tools which can also simulate outcomes for individuals and groups in service use, personal decision-making and life planning.
- Focus on critical societal challenges such as socio-economic change affecting employment, health, care, education, environmental and climate threats, energy efficiency, ambient assisted living, etc.

4.4 Measurement and monitoring

Measurement and assessment, for example to monitor performance and accountability, will make government and public services more efficient and effective. This is critical in times of limited budgets and the need to do more for less. ICT data and tools enable measurement and monitoring of public sector performance, efficiency and effectiveness to be significantly improved and rethought. Research measures should focus on the use of ICT to:

- Use data and modelling to enable greater focus on measuring public sector outcomes and impacts like successful service use, administrative burden reduction, and even growth, jobs and inclusion.
- Move down the government hierarchy, away from a focus only on central government's concerns, towards local measurement, the frontline and user engagement.
- Develop an open approach which recognises that everyone and every group can potentially engage in open measurement and monitoring of the public sector, including businesses, non-profits, social entrepreneurs, universities, the social partners, communities, citizens and hackers, and that this can be done either in collaboration with government or independently.
- Provide new measurement methods and tools which, for example, aggregate, compare and visualise performance data; capture user experience through social media analytics, crowdsourcing and web-scraping; and develop learning algorithms for recognising situations or events.

4.5 Civil servants and working practices

Equally important to empowering citizens is to empower public sector staff. Applications and processes are needed which enable civil servants, many of whom are frontline professionals and decision-makers, to themselves participate in ensuring government is open and engaging, for example by being equipped with the necessary skills, tools and support. Research measures should focus on the use of ICT to:

- Assist in updating legacy ways of working, of administrative cultures, and of the often embedded resistance to change, in a balanced and inclusive manner where civil servants are involved, consulted and help drive the process.
- Empower civil servants and managers to be involved in contributing to and making better decisions within their mandate by providing tools and methods for workflow and service monitoring, and analysing and simulating both their own activities and performance as well as of their departments and areas of operation.
- Train and upskill civil servants in public sector leadership, broader governance competencies, as well as in eSkills using, for example, personalised and technology-enhanced learning platforms which exploit open educational resources and processes.

4.6 Research which is ambitious, directed at society's challenges and academically robust

Ambitious research into ICT-driven public sector innovation should be based on the rigorous development and testing of scientific theories, concepts, methods and tools, but which also directly supports policy makers and practitioners in successfully deploying research results. The overall aim should be to help address Europe's complex societal problems, as well as build Europe's scientific base and community.

Annex 1: Expert Workshop Report

Annex 2: Report of the Online Consultation