



EIPonAHA - 3.2.1 - INSPIRE Project

Analysis of Innovation Procurement practices

Author of the document: INSPIRE Project - <http://inspirecampus.eu/>

Year of creation: 2015



International Network Supporting
Procurement of Innovation
via Resources and Education

Work Package: 2.
WP2 PCP Academy

D 2.1 Analysis of innovation procurement practices

Version: 1.0
Date of Issue: August 2015



www.inspirecampus.eu

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This project is co-funded by
the European Union

Project data: FP7 GA: 611714
Duration: October 2013 - October 2015

Document Information

Full title	International Network Supporting Procurement of innovation via Resources and Education		
Project Number	FP7 – ICT - 611714	Acronym	INSPIRE
Project URL	http://www.inspirecampus.eu		
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Date of delivery	Contractual: Month 22 (end July 2015)	Actual: Month 23 (August 2015)
Nature	Report	
Dissemination Level	Public (PU)	

Document History				
Date	Version	Author	Change	Status
November 2014	0.1	Sara Bedin & all partners	First draft	Draft
February 2015	0.2	All partners	Case studies added also at inspirecampus.eu	Draft
August 2015	1.0	Suzan Ikävalko	Final revision	Final

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Keywords	PCP / PPI implementation, innovation procurement approaches, case studies on innovation procurements, national approaches to innovation procurement
Abstract (for dissemination)	<p>The idea of using public procurement as a vehicle for innovation is rooted in the recognition that today's sophisticated needs and fulfilment of those may not be viable merely by purchasing particular goods or services "off the shelf"- for the simple reason that the needed solutions may not exist on the market yet.</p> <p>This document provide a systematization and a critical analysis of relevant and practical innovation procurement cases, in order to understand what are the challenges to be faced and the benefits to be achieved implementing (in a proper way) PCP and PPI in health sector (eHealth, Active Aging and Independent Living).</p>

Distribution List		
Date	To	E- mail
11.8.2015	Partners	
14.8.2015	EU Project Officer	jaakko.arnio@ec.europa.eu

Public

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Executive Summary

There are efforts that are being developed in order to promote and facilitate the application of the PCP and PPI procedures, and to include innovation amongst the goals that can be achieved through public procurement and through the coherent design of contractual arrangements. However, the implementation of these approaches can be still considered as exceptional and in a certain sense un-known (or partially known) amongst the public sector actors responsible for purchasing goods and services on the market.

The successful implementation of innovation-oriented & demand-driven procurement strategies may require, as assumption and pre-condition, both cultural and an organizational changes within the public administration: once it is acknowledged that the appointed public procurers have the required vision and proper skills-mix to govern a complex innovative public-procurement process, they should be encouraged to take the necessary decisions to engage in ambitious innovative efforts, instead of acting in the less risk-averse fashion. Then, they should be provided with the proper tools, like PCP and PPI. On the contrary, so-called PCP and PPI implemented with a conservative approach will not be able to exert results.

In general, but with relevant exception (e.g. Lombardy pilot, Decipher, EcoQuipp, NHS-NIC case that we can call “good practices”), **the change in perspective needed to move from traditional “push” and “market-driven” strategies to more effective “pull” and “really demand-driven” ones seems to be generally under-estimated.**

Introduction

The idea of using public procurement as a vehicle for innovation is rooted in the recognition that today's conditions almost certainly give rise to sophisticated needs, whose fulfillment may not be viable merely by purchasing particular goods or services "off the shelf", for the simple reason that such solutions may not exist on the market yet.

Innovation public procurement can be classified into a wide array of varieties, especially according to the type of innovation pursued (radical, adaptive, and incremental). This deliverable is not devoted to a detailed analysis of the single varieties, but will consider two of the most widespread approached of direct public procurement of innovative solutions, namely pre-commercial public procurement (PCP) and public procurement of innovative solutions (PPI)¹. Their importance in today's debate is considerable, since in the last decade European Institutions have focused on these procurement schemes as a possible means of switching from a push to a pull innovation strategy.

The INSPIRE project is about addressing the confidence issue in pre-commercial public procurement (PCP) and public procurement of innovative solutions (PPI) by creating a stakeholder ecosystem and a communications platform intended to inspire public procurers from Member States responsible for defining the acquisition strategies for innovative solutions in eHealth, Active Ageing and Independent Living, to explore how the R&D&I investments can be brought to market through PCP and PPI.

The Task / Deliverable 2.1 is dedicated to gather information and to provide a systematization and a critical analysis of relevant and practical innovation procurement cases, in order to produce knowledge on innovation procurement and, moreover, to understand what are the challenges to be faced and the benefits to be achieved implementing (in a proper way) PCP and PPI in health sector (eHealth, Active Aging and Independent Living).

¹ **Public procurement of innovation (PPI)** - The object of such procurement is a new good or service, especially designed to address a particular public needs. In other words, the public procurer issues a tender, specifying the functions that the innovative product is intended to fulfill. Note that, while this setup preserves the original features of "regular" public procurement, the output of this form of procurement is now intimately linked with the production of innovative solutions. Public procurement of innovation is more frequently used when the object procured is deemed to be so close to the current technological frontier that its production is within the firm's reach without an excessive R&D effort. Public procurement of innovation will thus usually be associated with incremental and adaptive advances, rather than with radical ones.

Pre-commercial procurement (PCP) - Its final output is not a product (either existing or innovative), but a research and development service. Hence, this particular instrument targets a form of innovation that is more ambitious and disruptive than public procurement of innovation, capturing all the cases in which a substantial amount of R&D is still needed to obtain a final product or service. Once more, at the root of the pre-commercial procurement innovation strategy lies the public procurer's ability to highlight the most pressing societal and public needs; however, in this case the public procurement activity only seeks to create the conditions for the fulfillment of such needs. By definition, pre-commercial procurement is limited to the "pre-commercial" phase of an innovative product's life cycle, while the commercialization phase is left in the hands of private firms and agents.

This effort will showcase benefits for the PCP/PPI practitioner (who receives peer-review, feed-back from ‘critical friends’), but it also enables a harmonization of approaches in different countries, shaping concrete opportunities to pool demand and collaborate.

Approach and Methodology

To achieve the objectives, the INSPIRE partners (all were involved in D2.1) elaborated at the beginning of the project a questionnaire to collect qualitative information about PCP and PPI implemented at EU and local levels. The questionnaire was presented at an EU Commission DG Connect Innovation procurement consultation meeting (by invitation only) in February 2014 with key stakeholders from different Member States present. The questionnaire was sent to all known ongoing PCP -projects (in INSPIRE thematic field) and it was also published at the INSPIRE web site (www.inspirecampus.eu).

The INSPIRE consortium received as feedback however, mainly partially filled-in questionnaires, where relevant information was missing. At a second stage, implementing a problem-solving approach, the consortium then focused on the procurement implementations directly known and followed by INSPIRE partners. **Relevant cases were selected to be studied more in detail. The case analysis is based on written feedback and on interviews that partners conducted with the project leaders of the projects. Experiences coming from other stakeholders in the projects were also considered.**

The task has also benefited from the direct networks, knowledge and direct experiences of INSPIRE partners. The consortium has collectively identified seven concrete cases/experiences which have taken place or are taking place in several EU Member States. They all present innovative element in relation to the procurement procedure or/and innovative requirements. Cases cover in particular the following Member States: United Kingdom, Italy, Austria, France, Spain, Finland, and Denmark.

The aim was to analyze more in depth a few relevant cases with particular focus on health-care domain, that represent a significant sample, with different levels of awareness and maturity of innovation procurement.

Consortium intentionally considered cases implemented by/with the contribution of various types of actors (central purchasing bodies, regional or local contracting authorities, innovation agencies and hospital) and the entire end-to-end process that they are using to materialize their public needs in innovative solutions.

The entire case descriptions and analysis can be found on: <http://inspirecampus.eu/academy-access/overview/case-studies/>

The below cases have been studied:

	type of public authorities	Partner responsible for monitoring and updating the case study
Silver	Municipalities, Regional service providers	NHG

Public

Lombardy Region	Hospital, innovation policy maker, regional general direction for health-care, Regional purchasing authority	Ambrosetti
Decipher		AQUAS
Innobooster		BBG
HAPPI	Central purchasing authority	RESAH
EcoQuip		Ambrosetti
NHS-NIC Blood donor chair	Central Innovation Unit	BITECIC

In order to classify as PCP or PPI and frame the experiences within the scope of INSPIRE, we have adopted a check-lists, as follows.

	relevance and applicability
1. a Object: R&D services	PCP
1. b Object: innovative solutions	PPI
2. Demand side driven approach (need /challenge definition)	PCP & PPI
3. Separation with the procurement of commercial volumes of end-product and no preferential treatment in the supply of the final product (re-opened competition)	PCP
4. Absence of exclusive condition: the public purchaser does not reserve the R&D results exclusively for its own use	PCP
5. Open and competitive procurement (no invitation-based or restricted procedure)	PCP & PPI
6. Development in phases	PCP
7. Multiple-sourcing contract	PCP
8. Retaining at least two participating companies until the last phase to ensure a (future) competitive market	PCP
9. Open, transparent, non-discriminatory selection procedure based on objective selection and award criteria specified in advance of the bidding procedure	PCP & PPI
10. Contractual arrangements (including IPRs), rights and obligations allocation decided upfront and made available to all interested bidders in advance	PCP & PPI
11. All potential bidders (including SMEs) have equal chances to bid against the same contractual condition	PCP (PPI)
12. Awarded criterion: MEAT (competition also on price)	PCP & PPI

As the basic assumptions for PCP and PPI are that: i) public procurement is used as a vehicle for innovation and not merely to fulfill ordinary needs by goods or services “off the shelf”, ii) public procurer determine a real “demand-pull” effect to the market, it is clear that the first two criterions in our check-list (1a/b; 2) are mandatory to define an experience as **“innovation procurement = innovation oriented & demand-driven procurement”**².

The main characteristics / issues of innovation procurement analysed have been:

- Identification and assessment of unmet needs within (and starts from³) the public bodies
- Involvement of users in specification of requirements,
- SoA analysis via open technical dialogue and early market engagement,
- Specification of functional / performance-based requirements,
- Evaluation and verification of innovative solutions (either within the tendering process or in pre-commercial phase),
- Shared allocation of risks and benefit (including IPR management),
- Enable the participation of SMEs,
- Enhance the competition during execution and facilitate innovation over the contract period.

The analysis of these innovation oriented procurement experiences will be used as a starting-point to conduct and develop the Gap analysis and Recommendations later in INSPIRE Deliverable 2.5.

Further understanding is also acquired through INSPIRE workshops, where these topics have been discussed and feedback from the audience and speakers has been acquired.. Ongoing INSPIRE project work and networking with other PCP/PPI initiatives and project has also provided opportunities to collect information for the INSPIRE gap analysis D 2.5.

Findings

In a broad sense, the implementation of innovation procurement (PCP and PPI) approaches can be still considered as exceptional and in a certain sense un-known (or partially known) amongst the actors responsible for purchasing goods and services in the market. We can affirm this despite the efforts that are being developed in order to promote and facilitate the application of the PCP and PPI procedures and to include innovation amongst the goals that can be achieved through public procurement and the coherent design of contractual arrangements.

In the former/standard approach the drive to develop and introduce new solutions on the market lies with the firm/ supply side, which tries to foresee the evolution of demand or to “create” a need for new

²³ Differently, HAPPI project have implemented a “market-oriented approach” that starts from the scan of supply-side offer and is finalized to buy “off-the-shelf” solutions. The HAPPI project represents an intervention aimed to create an interface between public and private agents and thus spurring the adoption of un-known and valuable solutions.

products / services on the consumer side. With PCP and PPI it is public demand that triggers innovation by setting challenging (and well-defined) targets and requirements (and possibly new standards) for the producers.

Innovation procurement intrinsically entails risks that tend to increase with the degree of innovation involved. The successful implementation of innovation-oriented & demand-driven procurement strategies may thus require, as assumption and pre-condition, both a cultural and an organizational change within the public administration. This enables the necessary decisions to engage in ambitious innovative efforts, instead of acting in the less risk-averse fashion.

In general, this change in perspective needed to move from traditional “push” and “market-driven” strategies to more effective “pull” and “really demand-driven” ones seems to be under-estimated and not well metabolized, before starting with PCP and PPI. Relevant exceptions include among others the Lombardy pilot, Decipher, EcoQuipp and NHS-NIC cases that we can call “good practices”.

From INSPIRE scanning activity on innovation procurement initiatives in EU, we can draw some main general conclusions:

- As first point, we can see that the predominant approach of many European authorities to innovation-oriented public procurement appears to be too conservative to achieve real and significant technical advance.
- As second point, we can see that the skill-mix and incentive-system required hasn't been adequately changed so far, with the result that the innovation procurement strategy is not implemented and not braking through and consequently the impact is, in most cases, inhibited.

The main factor of complexity and obstacle is the hyper-fragmentation of procurement responsibilities and budgets. Indeed, the involvement of local authorities may entail pitfalls. On the one hand the fragmentation of resources across many small procurement units may dampen the scale effects associated with innovative procurement and the market opportunities. On the other, the involvement of a wide variety of agents is not compensated by a strengthened coordination and joint strategic planning. This results in resource dispersion and duplicated projects undertaken at different governmental levels.

In very general term, most successful PCP/PPIs are those done by real public demand side actors that have a strong knowledge of the real requirements and, in particular, can:

- enable quality improvements of public services;
- optimize public expenditure, gaining savings;
- align PCP/PPI developments with sectorial regulatory actions;
- attract external investors via seal of approval of first customer reference, thus supporting the development of the industrial ecosystem.

Looking inside the implementations collected, we can see that public contracting authorities, even when they have undertaken a PCP/PPI that meets the (first two) necessary points in the checklist, still differ in the way they have implemented the tendering procedure or process.

- The **involvement of final end-users** in specification of requirements has been considered as important and implemented by the majority of projects in order to ensure timely and correct introduction of the new solutions into public services.

In this area, the best practice comes from the NHS-NIC approach, called WIBGI method that enable the brainstorm of desired solutions (note the plural) and the effective involvement of those who ‘own’ the need and independent external experts from several relevant technology domains. This method has been also adopted by Lombardy Region to assess the needs.

The involvement of final users also in piloting and testing is explicitly programmed by the Lombardy Region within the last phase of PCP. It has been also concretely implemented during the innovation procurement of NHS, which established a testing center specifically to involve all relevant users in the piloting process.

- Cases show that the **earlier “engagement and involvement “of the market** has been implemented differently across EU with a different levels of formalization. PPIs are mostly oriented to “meet the market” to ascertain whether the public authority needs can find a solution in the market – thought the PPI process.

The two PCPs (Lombardy Region and Decipher) have implemented a structured state of the art investigation aimed to assess the existence on the market of commercialised products complying with the defined requirements. In particular in Decipher, the state-of-the-art study aim was to provide technical background information for the development and procurement of the new service and technical guarantee that the solutions developed during the project will be innovative and potentially protected by IPR.

In Lombardy Region, an in-depth state of the art analysis has been carried out, by means of an open technical dialogue with the market (conducted through public hearings, advertised explorative calls for tender and an in-depth world-wide patents analysis), to assess the non-existence on the market of commercialised products complying with the requirements and shortcomings which require new R&D. The merit of having operationalized the technical dialogue process aimed to obtain a better understanding of on-going industrial product developments in terms of solution availability and technological maturity pertain to Lombardy case.

In synthesis, the market consultations performed by these PCP cases have enabled an information asymmetries reduction. It isn’t possible, with the information obtained, to confirm the same evidence with regard to the PPIs studied.

- PCPs and PPIs have commonly operated to encourage the active proposition of innovations (application ideas and technological choices) by the supply side, defining the **needs for innovation in terms of functional and performance requirements**, without identifying a specific solution.

Here, the Decipher project has developed an interesting methodology to elicit the functional specifications, called FAST (Functional Analysis System Technique). According to this methodology the basic element of a system is the Function that describes the original intent or purpose that a product, process or service is expected to perform.

The Lombardy pilot has designed a methodology aimed to support the formulation and classification of functional and performance requirements according to the product life-cycle phases: production, delivery, installation, use, management, maintenance and disposal in order to encourage bidders to assure high long-term performance.
- At the same time, we get preliminary evidence that in some cases (e.g. Silver project) a not **sufficiently detailed analysis and description of requirements** has hampered to get comparable market solutions. This is a crucial point, as the only way in which solutions will meet their performance targets and expected impacts is for them to be specified upfront, clearly and unambiguously by the demand-side (and not promoted and suggested by the supply-side). As reported in Lombardy case description, it is a simple fact that if functions and performances are not a stated criterion of the solution requirements then the product designers will generally not consider (strictly) performance or resulting/expected outcomes.
- Through the case studies, we can also observe that public contracting authorities are not used to **undertake a business case analysis** and this leads to the difficulty to achieve measurable cost saving and/or quality enhancing goals and, moreover, to understand if the market is offering the best value for money.
- With the exception of Lombardy and Erasmus projects, the consideration of the **whole life-cycle cost and impact** of the offered solution hasn't been generally translated into proper awarding criteria in order to provide strong and concrete incentives to look at the whole life-cycle impact and to reduce the total cost of ownership. System level value creation is thus not generally considered as driver and objective in innovative procurements. More in general, we get preliminary evidence that the needs of the public authority are only partially reflected in the awarding criteria.
- The challenge to **increase SMEs involvement** in innovation programs is still too often handled by breaking the procurer's requirement into smaller parts or by encouraging the large suppliers to form alliances with smaller partners or to involve SME in the project. It isn't metabolized that innovation procurement has the objective to develop new (completely, significantly or partially) solutions for public sector problems for which there are no solutions available or completely available, so no customer references are available on the market yet. This means that is mandatory to avoid stringent qualification requirements (as in procurements for large scale product), making procurement more easily accessible and allowing SMEs to work out their own ideas and step outside the traditional subcontractor role, without any preferential treatment.

- The definition of a strong incentive system **aimed to stimulate a wide commercialization** has been explicitly undertaken only by Lombardy Region with a definition of a call-back option and a benefits sharing mechanism between procurer and suppliers.

Finally, we can assert that the successful implementation of innovation-oriented & demand-driven procurement strategies may require both a cultural and an organizational change within the public administration: once it is acknowledged that the appointed public procurers have the required vision and proper skills-mix to govern a complex innovative public-procurement process, they could take the necessary decisions to engage in ambitious innovative efforts, instead of acting in the less risk-averse fashion. Then, they should be provided with the proper tools, like PCP and PPI. On the contrary, so-called PCP and PPI implemented with a conservative approach will not be able to exert results.