Lessons Learnt from a joint EC Co-funded PCP - Cloud for Europe

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Abstract: The objective is to provide an intermediate evaluation of the Cloud for Europe project by describing lessons learnt to date and focussing on effectiveness, efficiency and risks. The lessons learnt include: (1) a PCP for Cloud Computing runs the risk of being overtaken by policy changes, or by technological developments in fast evolving markets. Increasing the level of innovation of the challenges in the tender may remedy that, as well as keeping the timeline of the PCP aligned with the speed of changes. (2) The Lead Authority procurement model is too fragile. Some form of redundancy should be introduced to make it more resilient. (3) Procurement models for joint, international procurement should be robust in order to keep performing well at all times. By taking these lessons learnt into account, the potential impact is that PCPs can become more successful although further work is needed on positioning PCP amongst other procurement processes for innovation.

1. Introduction

Pre-Commercial Procurement (PCP) is a relatively new procurement process designed to procure research and development services [11], [14]. The PCP procedure falls within the exemption from the procurement rules for research and development services under article 16 f of Directive 2004/18 [2]. The new Procurement Directive, which has been adopted by the European Parliament [15], maintains this exemption and also introduces a new instrument for procurement of innovation, namely the innovation partnership (IP). This instrument can be used for the procurement of services, works and supplies, in contrast to PCP that can be used to procure only services.

A PCP consists of three phases: solution exploration, prototyping and original development, that are preceded by an exploratory research phase on the challenges to be tendered, see [2] and Figure 1. After a PCP has been concluded a Public Procurement of Innovation (PPI) may follow and tackle the commercialisation of the research and development results of the PCP. Competition between suppliers is encouraged during all PCP phases.

PCP is quite new and therefore currently not a very well established instrument in procurement. Several European countries such as Austria, Germany, Italy and the Netherlands, have defined innovation procurement strategies [9]. Italy implemented national guidelines for PCP in 2012. “Since 2004, three member states (the United Kingdom, the Netherlands and Belgium) have experimented with national versions of the Small Business Innovation Research (SBIR), a PCP-like programme in the United States” [4], see also [13]. Since 2012 the European Commission has co-financed pan-European consortia of public procurers to jointly implement PCP, such as PRACE 3IP, CHARM,
SILVER, SMART@FIRE and Cloud for Europe [12]. Cloud for Europe\(^1\) aims to enhance cloud adoption in the public sector by using PCP as a collaboration between public authorities and industry, with a view to overcoming the obstacles to cloud adoption by introducing innovative solutions required to build trust in Cloud Computing. The project started in June 2013 and has an initial timeline of three years. It is co-funded by the European Commission under the Seventh Framework Programme for Research and Innovation (FP7) [10]. Twenty-four partners from twelve countries participate in the project. The partners were assembled by networking and lobbying, and by the efforts of the project coördinator. The partners brought procurement knowledge and Cloud Computing knowledge into the project.

Cloud for Europe is innovative in two ways: (1) by seeking innovative Cloud Computing services and (2) by doing so via an innovative form of procurement, namely a joint, co-funded PCP at an international level. PCP is an instrument to tender research challenges for problems related to services to which the market does not provide solutions. Thus the procurers can drive the research and development activities of the market in a direction they consider suitable for the public sector by organising public consultations between industry and the public sector, and by creating functional specifications for non-existing cloud solutions. Due to the innovative nature of the PCP process the participants encountered some teething diseases for which mitigation is required. The objective here is to undertake an intermediate evaluation of the Cloud for Europe project [13], the results of which may help to improve future projects of a similar nature, and to identify changes to the PCP procedure itself.

The research questions are: “What lessons can be learnt from this intermediate evaluation of the Cloud for Europe PCP after phase 0?”, and “How can the lessons learnt be used to improve PCPs?”

The intended audience consists of procurers, partners in PCPs, researchers of procurement and Cloud Computing, and European Commission staff. Section 2 describes the methodology used, Section 3 the case description, and Section 4 the conclusions and recommendations.

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2. Methodology

A single case study was carried out, which demonstrated intermediate results of the Cloud for Europe project. The lessons learnt were based on participating in the project as a procurer. A brainstorming session among Cloud for Europe partners in Porto in March 2015 was used as a starting point for the intermediate evaluation. Input from several PCP partners was used and the evaluation drafts were then made available to the project participants for validation and their comments processed. A peer review was held in the Netherlands with a staff member active in another PCP. Subsequently, the intermediate evaluation was finalised.

3. Case Description

This intermediate evaluation considers effectiveness, efficiency and risks. Some of the topics addressed are the procurement model, the selection of research challenges for tendering, the dynamics in the number of procurers, and the timeline.

3.1 Effectiveness in reaching Goals

This section describes the progress made in reaching the goals of the European Union, Cloud for Europe and PCP as combinations of goals and experience.

3.1.1 European Union Goals

Goal 1: adherence to core EU principles (such as non-discrimination, transparency, equal treatment). Experience: from the beginning it was not clear whether bidders from non-EU member states could participate in this project. Only after the publication of the tender did the Commission staff notify us that not only EU member states could participate but also associated countries participating in FP7. The consequence was that the scope of participation in the tender documentation had to be adjusted, while the opportunity for procurers to extend the deadline for submission of proposals was limited. Therefore equal treatment of all potential bidders was not fully achieved, since the non-EU member states participating in FP7 had less time to prepare their bids.

Goal 2: some level of competition between vendors during the PCP phases. Experience: for all lots multiple proposals were received (13 for lot 1, 7 for lot 2, and 4 for lot 3), indicating that the project may succeed in concluding the PCP with multiple tested pilots, thereby having some level of competition in the subsequent PCP phases and pro-actively preventing single vendor lock-in. For the progression of a PCP it is important that the tender documentation does not require a certain minimum number of bidders to remain in each of the three PCP phases. Reaching a solution for a problem is more important than achieving a minor PCP goal, such as “competition in all phases to obtain best value for money”. It should not be necessary to stop a PCP if for specific lots the competition goal is not met precisely.

Goal 3: obtain the involvement of small and medium enterprises (SMEs) as well as multinationals. For a definition of an SME see [5] and [6]. Experience: a variety of economic operators were involved in the bids received: 45% represent SMEs, 24% large companies and 31% public research bodies.

3.1.2 Cloud for Europe Goals

Goal 1: harmonise the requirements from different public sector organisations in different countries. Experience: during the PCP preparation a service catalogue was assembled from the candidate services proposed by the partners. This catalogue was discussed with industry representatives in market consultation workshops and consolidated. So, for example, some
services were combined, since they had overlapping functionality. After a carefully designed decision procedure and discussions between procurers, challenges were selected for three lots to be tendered based on mutual interest and the willingness to tender together.

Goal 2: remove obstacles for cloud adoption since the expected outcome of cloud adoption are the EU goals of more jobs, increased gross domestic product (GDP) in Europe and a better service of the public sector to other public organizations and to society [7]. Experience: although we have identified several obstacles for the adoption of the project deliverables, it is too early to determine whether we will succeed in removing the wider set of adoption obstacles with the Cloud for Europe results, and whether the EU goals of the project will be met.

3.1.3 PCP Goals

The regulatory effectiveness of PCP in general has been investigated by Apostol in her thesis “Pre-commercial procurement-regulatory effectiveness?” [4]. Her conclusion is “that the current EU policy and legislative framework does not optimally support the effective and wide implementation of pre-commercial procurement. The barriers to the wide and effective implementation of PCP lie both in the legal and the public policy sphere. They can be swiped away through additional guidance or legislative amendments” [4]. With respect to reaching of PCP goals in Cloud for Europe, the following text serves.

Goal 1: obtain products / services that have to be developed and that will better fit public sector needs than existing ones. Experience: in some countries it was difficult to describe innovative services for Cloud Computing since there were no cloud implementations when the project started. Some public sector needs could be fulfilled by existing products on the market. The public consultation helped to identify the public sector requirements, so in principle we can obtain products that better fit public sector needs. However, public sector requirements change and Cloud Computing market offerings change, so whether or not this goal is achieved, can only be determined after some time.

Goal 2: shorten time to market for suppliers. Experience: since the Cloud for Europe PCP has an initial timeline of three years before commercialisation, it is questionable whether the time to market is shortened. The Cloud Computing technology market is evolving quickly and therefore suppliers may find it difficult to provide solutions for a timeline that long. The innovation partnership, another new procurement process as indicated in the introduction, may shorten the time to market more for suppliers of services than PCP, since in that process no additional regular tender is required to procure the commercialised results of the research and development.

For the goals “Wider commercialisation of research and development results” and “Foster innovation through public procurement”, there will be more information after the PCP is finalized.

3.2 Efficiency of the PCP

In this section some information is provided on experience of maintaining the timeline and the efficiency aspects of the project. The topics are described as a combination of experience and recommendations for improvement.

Experience 1: the timeline of the procurement process. PCP projects can determine their own timeline. The initial Cloud for Europe timeline of three and a half years is rather long for an area which is as fast moving as IT in general and Cloud Computing in particular. After the three phases, commercialisation, possibly via a PPI, and a commercial tender procedure may be required to actually implement and use the results on a broader scale. Then the complete timeline may easily take five years. Innovations in Cloud Computing occur much quicker than the current Cloud for Europe procurement process can handle.
Recommendation: a shorter timeline may lead to better alignment with respect to delivery of innovative Cloud Computing services and to European suppliers becoming a more competitive force in the world market for Cloud Computing. In general the timeline of a PCP should be proportional to the speed of technology changes in the market and government policies. Another procurement procedure, the innovation partnership, may provide a swifter solution, since it offers procurers the option to get involved in a partnership and to buy the innovative product, work or service immediately after its successful development, since there is no requirement to start an additional commercial procurement procedure. A precondition is that the price-quality level is determined upfront. It is recommended to investigate which type of procurement process for innovation is suitable for the challenges at hand. In [16] an example of comparing procurement processes for innovation is available on pages 42-44. Sloth compares open tenders, restricted tenders, procuring without tender, design contests, negotiated procedure, framework agreement, competitive dialogue (CD) and PCP, but this comparison is mainly looking at advantages and disadvantages. In [17] Wolfswinkel concludes that PCP and IP provide more room for radical innovation than for incremental innovation, and for CD it is the other way around. Further work is needed to provide a clear positioning of innovation procurement processes and the decision support to make the right choice.

Experience 2: the procurement model. In Cloud for Europe, the selection of the procurement model and Lead Authority took six months. There are two different procurement models that can be selected to perform PCPs:

- the Lead Authority Model with a joint framework contract. The procurers elect one procurer as Lead Authority, who is the single point of contact for all bidders and who is responsible for all the procedures, including the publication of the tender. The Lead Authority works in close collaboration with the other procurers, and is regulated by a procurers’ contract.
- the Common Procuring Entity Model. In this model procurers have to establish an external legal entity. Two options were considered: a European grouping of territorial cooperation, and an association registered under Italian law. A third option, a European research infrastructure consortium (ERIC) was not considered, since Cloud for Europe does not procure research infrastructures (adapted from [1]).

<table>
<thead>
<tr>
<th>Lead Authority Model</th>
<th>Common Procuring Entity Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>Does not require an additional legal entity since one of the procurers can take up this role</td>
<td>Does require an additional legal entity, the Common Entity</td>
</tr>
<tr>
<td>Does not require a permanent organisation</td>
<td>Does require a permanent organisation</td>
</tr>
<tr>
<td>Less time consuming</td>
<td>More time consuming (six months extra for initial authorisation from each public authority)</td>
</tr>
<tr>
<td>More cost effective</td>
<td>Less cost effective due to the costs of the permanent organisation</td>
</tr>
<tr>
<td>Applicable law is that of the country of the Lead Authority</td>
<td>Applicable law is that of the country where the Common Entity is established</td>
</tr>
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Table 1. Comparison between the two joint PCP models

Cloud for Europe selected the Lead Authority Model. The other model requires public sector contracts to build a legal entity, which takes a lot of time and was not feasible given the deadlines. Furthermore, Cloud for Europe is concerned with a one-off procurement and not recurring procurements for which it could be relevant to set up a permanent organisation. An important issue in the procurement process was handling of Value Added Tax (VAT) costs. In the FP7 programme’s VAT policy, VAT is not considered an eligible cost. Thus the procurers own investment would have been increased by about 20%. The decision in Cloud for Europe to elect an Italian Lead Authority was, among other things, related to the fact, that Italian law provides a VAT exemption for research and development.
services procured within the scope of the EU FP7 programme. This tax exemption regime for VAT purposes, is enshrined in Italian law and is applicable to those public purchasers who are VAT taxable persons established in Italy, that buy research and development services necessary for the execution of the promotion of research based on an FP7 contract. The VAT issue seemed to play an important role in the choice of the Lead Authority, where one candidate provided VAT exemption and the other did not. In general, a Lead Authority should not only be chosen on the basis of fiscal criteria but also on the basis of procurement and quality criteria. The VAT issue has been solved in the EU’s Horizon 2020 programme by making VAT part of the eligible costs for EU funded PCPs. For PCPs, which are not funded by the EU, VAT handling may become an issue. Recommendation: selecting the procurement model can become easier if the positioning of the models, Lead Authority and Common Entity, is made clear upfront. For instance: use a Lead Authority Model in the case of one-off procurements, and consider a Common Procuring Entity Model in the case of a series of procurements. The positioning of the procurement models for specific innovation situations and the decision support to make suitable choices requires further work. Electing a Lead Authority at the beginning of the PCP on a vote by the procurers is good practice to save time (adapted from [1]). The election of the Lead Authority should be a choice of the procurers. Cloud for Europe used a weighted voting procedure with the weights related to the budget brought in by the procurers, to select the Lead Authority from two candidates. The two candidates had to provide information on their expertise and experience to the other procurers to indicate why they should be chosen for this role. VAT handling for PCPs, which are not funded by the EU, still requires attention.

Experience 3: the language. From a legal point of view, it would be good to have an English version of the tender documentation and a version in the language of the Lead Authority, but it is not an obligation in all member states. Cloud for Europe investigated this issue with the procurers and in their countries. It was found that with the countries at hand Cloud for Europe could publish only in English to save time with the contracts and tender documents (adapted from [1]). Recommendation: investigate among the countries involved whether it is sufficient to have the contracts in one language only, or whether two languages (English and the language of the Lead Authority) are more efficient in the long run in case court trials are likely to occur.

Experience 4: a changing number of procurers. The Cloud for Europe project was open to include additional procurers during the project up to the tender publication. The understanding of the joint international PCP was not clear at the beginning of the project. Candidate procurers from different countries thought of having a national tender instead of a joint PCP tender, or expected to procure commercial services instead of pre-commercial services. Although there is co-financing from the European Commission, procurers have to invest as well. Political changes in some countries enforced certain procurers to withdraw from their commitment. One procurer had to withdraw because the Commission did not view them as a public entity. New procurers joined the project, but these changes led to a delay of the tender publication. Recommendation: clarify at the beginning the meaning of a joint international PCP. When allowing new procurers to join the PCP, they should have a clear idea of what the tender is about and the existing procurers should accept only those as new procurers who embrace the tender strategy and existing documentation. Entering and leaving the PCP as a procurer should be stopped at a certain point in time, namely some time before the tender is published to protect the process of developing functional specifications, contracts and tender documentation.

Experience 5: the selection of Cloud Computing challenges. The selection of research challenges took a lot of time since the project partners came up with many different Cloud

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2 Art. 72, first paragraph under C of the Presidential decree No. 633/72.
Computing challenges. Additionally, procurers who were recent entrants into the PCP proposed new functionalities up to a very late stage in the process so that the functional specification of the chosen research challenges came under time pressure. Recommendation: start early to reach a common problem focus, or select procurers who already have a common problem focus.

3.3 Risks

In this section some identified risks are described, together with suggested mitigating measures.

Risk 1: the Lead Authority Model may fail. The Lead Authority Model seemed the only real option for Cloud for Europe given the timelines of the project, which did not allow for setting up an external Common Entity. However, the Lead Authority Model is very fragile. The Lead Authority performs a central role, but there are various risks involved. What happens if the Lead Authority’s organisation is subject to a drastic re-organisation, and the timeline of the project cannot be extended? What happens if the country of the Lead Authority is a member state that withdraws from the European Union for political reasons, while the PCP is taking place? What is the alternative, if the Lead Authority does not live up to the promises made? What is the escalation path? Mitigation: in general, procurement models for joint international procurements should implement some form of redundancy and fall-back mechanisms to become more resilient in dynamic times. Mitigations can be:

- The procurers’ contracts contain articles describing what happens when the Lead Authority is not able to proceed or live up to the commitments made;
- Another procurer takes over the role of the Lead Authority. Since another procurer may come from a different country, this arrangement requires that the PCP contracts are adjusted to this country, or alternatively written in the format of the country of the Lead Authority and the alternate Lead Authority right from the start. Another possibility would be that procurers, instead of having a procurers’ contract, arrange a memorandum of understanding (MoU) amongst them, wherein the applicable rules of procedure are established. This option would better suit the nature of an agreement between several public bodies from different countries and would eliminate the aforementioned contract problems.
- A switch is made from the Lead Authority Model to the Common Entity Model and the timeline of the project is lengthened accordingly to accommodate this change.

Risk 2: the PCP process is intended to attract bidders from all EU countries and, in this case, all FP7 countries. However, in the Cloud for Europe project it turned out that 53 % of the bidders were based in the country of the Lead Authority and the other countries only delivered 3-7 % of the bids. An explanation could be that the PCP procedure as such is not well known in the other countries associated with FP7 despite the promotional efforts of the Cloud for Europe team. Another explanation is that consortia and multinationals used their Italian office for their bid. Further investigation is needed on this topic if this observation also holds in other international PCPs. Mitigation: put more effort into promoting the project in various countries and further investigate this phenomenon in other international PCPs.

Risk 3: a situation may occur where the services in the tender are no longer needed by the public authorities in some countries, due to government policy changes occurring after the publication of the tender. Mitigation: increase the level of innovation of the services to be procured, and closely follow government policy changes. The level of innovation is described in the Oslo Manual [3]. It may take the values: “new to the organisation”, “new to the market” or “new to the world”. For challenges that are new to the market or new to the
world there is less likelihood that government policy changes will make the services redundant.

Risk 4: the services in the tender prove to be already available on the market after the tender is published, eliminating the innovative nature of the tender. Mitigation: in Cloud for Europe we used dialogues with industry and a market research firm to investigate whether the cloud services in the services catalogue were in the market or not before the tender was published. However, this presented quite a challenge for the market researchers. Time should be built in to allow market researchers to reach a valid conclusion on whether the services exist in the market or not.

Risk 5: the services in the tender become available on the market from other suppliers during the PCP project. Mitigation: continue with the PCP to enhance competition and prevent single vendor lock-in.

Risk 6: the selection of services is difficult and PCP partners try to merge services, creating requirements that are too broad to receive successful bids. Furthermore, the available budget can become insufficient for the merged requirements. Mitigation: stop merging services when they tend to become overloaded with requirements. Make clear decisions on which services to select, and do not try to satisfy all partners by merging the services they propose. Another mitigation can be to start with a clear focus, and not allow the requirements to become disproportionate to the time and budget available.

Risk 7: the tender documentation only reflects the requirements of the procurers, and not of the non-procuring partners, possibly resulting in Cloud Computing services that cannot be used EU-wide. Since partners come from different EU states with different needs and legal frameworks, the procurers may not expand their goals to include specific needs or respect the restrictions of the non-procuring countries. The non-procuring partners understand the special position of the procurers and restrict themselves or become passive observers of the PCP. Mitigation: the role of the non-procuring partners should be made more explicit so as to use their knowledge and expertise effectively for the outcome of the PCP.

Risk 8: less than the anticipated minimum number of bids are received and accepted to guarantee a sufficient level of competition in the next PCP phases. We anticipated a minimum number of four bids per lot, but this did not prove to be feasible for all lots. Mitigation: take care in the wording of the contract texts in the tender documentation, so that the PCP can continue, even when the anticipated minimum number of bids is not met for all lots.

4. Conclusions

What lessons can be learnt from this intermediate evaluation of the Cloud for Europe PCP after phase 0? The conclusions with respect to effectiveness, efficiency and risk are summarised below.

Effectiveness: progress for some goals was made, some level of competition was achieved, as well as SME participation and harmonisation of requirements from different countries. The evaluation of progress in reaching other goals requires more time.

Efficiency: whether PCP is a good instrument for IT services is debatable. The PCP project timeline and the timeline from innovation to practical exploitation of a solution need to be related to the speed of the developments in the technology market and to government policy changes. Since PCP projects can plan their own timeline, this is an important consideration for planning the PCP upfront, and adjusting the timeline as and when required during the PCP.

Risks: (1) solutions developed by the market may overtake public sector innovation initiatives. In addition government policy changes may render certain innovative Cloud Computing services redundant. Increasing the level of innovation of challenges in the
tender may remedy that. (2) Another lesson learnt is that the Lead Authority Model is too fragile for dynamic times. This procurement model is more popular than the Common Procuring Entity Model, since it does not require a legal entity to be installed, which is difficult to justify for a one-off procurement. The Lead Authority Model, however, presents a risk for joint procurement in case no fall-back mechanism has been implemented for the situation wherein the Lead Authority cannot meet the commitments made. We recommend to introduce some form of redundancy and fall-back mechanisms in contracts. An example of redundancy can be an alternate Lead Authority. In general, procurement models for international joint procurements should use redundancy to keep performing well at all times.

How can the lessons learnt be used to improve PCPs? By reflecting and acting on the proposed measures and mitigations, and by changing the PCP process. Some changes proposed to the PCP process and model are:

- do not require that a certain minimum number of bidders remain in each of the three PCP phases in order to obtain best value for money. Reaching a solution for a problem is more important than stopping the PCP when a minor PCP goal, such as competition in all phases, is not met.

- consider shortening the PCP process for fast moving technologies, and provide more flexibility to adapt the timeline during the PCP.

- introduce some form of redundancy in the Lead Authority Model.

Further evaluation of the Cloud for Europe project and the other international projects should happen next to see which observations in this evaluation are of a more general nature. Further work is required in our opinion. (1) Clearly position the procurement models (Common Procuring Entity, Lead Authority) and processes (PCP, PPI, IP, CD etcetera), and by doing so determine the field of application of procurement models and procedures and the decision support to arrive at suitable procurement choices for the challenges at hand. (2) Ways should be investigated to make the joint procurement models more resilient in dynamic times, for instance by building in redundancy. (3) More guidance on PCP is needed for all actors involved, procurers, non-procuring partners, bidders and legal advisors. (4) The low participation of bidders from countries other than the country of the Lead Authority should be thoroughly investigated in relation to the core EU principles of non-discrimination, equal treatment, transparency and proportionality.

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