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DiSSCo Prepare MS4.4 Requirements for the implementation of PCP

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In this milestone document, we aim to provide insight into the opportunities that pre-commercial procurement (PCP) could represent for DiSSCo, stemming from the efforts completed during the DiSSCo Prepare project and the internal collaboration with other workpackages. We build on the MS 8.4 document that provided background material and kept an eye out on DPP Task 7.2's analysis on legal entity models for DiSSCo, and their suitability for achieving DiSSCo objectives, as this will have a direct impact on the final procurement framework for DiSSCo.

To do this, we first situate pre-commercial procurement (PCP), as well as public procurement of innovation (PPI) within the commercial procurement landscape. Both schemes were created by the European Commission to encourage development and its scaling to market. We provide a view of when which applies and specifically for pre-commercial procurement, we dive deeper into what steps are involved in preparation and execution of procuring development.

We continue with what pre-commercial procurement could look like for DiSSCo as a European Research Infrastructure Consortium (ERIC). Next to indicating how it builds on the strategic cornerstones of DiSSCo, we show some examples we encountered that already show potential for pre-commercial procurement in the DiSSCo Construct project.

We wrap up with summarising the progress made at the time of this milestone. In short, we have created positive awareness on the topic and its potential to fuell innovation for the DiSSCo consortium and for its users. In parallel, we've highlighted the importance of connecting the dots between strategy, development and procurement in order to build strong partnerships.

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DiSSCo Prepare WP 4 – MS 4.4

Requirements for the implementation of PCP

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Abstract

The DiSSCo RI will require strategic partnerships with industrial partners, and many of these partnerships will rely upon a procurement framework. DiSSCo will work with partners to co-create services and co-develop products such as software and will contract with third parties for goods and services. A clear procurement strategy allows an organisation to align its long term priorities and objectives with its procurement processes, helping with partnership development, scaling up processes, risk mitigation and cost efficiency.

In this milestone document, we aim to provide insight into the opportunities that pre commercial procurement (PCP) could represent for DiSSCo, stemming from the efforts completed during the DiSSCo Prepare project and the internal collaboration with other work packages. We build on the MS 8.4[1] document that provided background material and kept an eye out on DPP Task 7.2's analysis on legal entity models for DiSSCo, and their suitability for achieving DiSSCo objectives, as this will have a direct impact on the final procurement framework for DiSSCo.

To do this, we first situate pre commercial procurement (PCP), as well as public procurement of innovation (PPI) within the commercial procurement landscape. Both schemes were created by the European Commission to encourage development and its scaling to market. We provide a view of when each applies and specifically for pre commercial procurement, we dive deeper into what steps are involved in preparation and execution of procuring development.

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[1] French, L. Livermore. L., Alonso, E.; Casino, A., Dusoulier, F., Groom, Q., Hardy, H., Juslén, A., Mergen, P. & Smith, V.S. (2021) Procurement Strategy and Policy: DiSSCo Prepare WP8 - Milestone 8.4.

Keywords & Abbreviations

<u>Procurement</u>:   Procurement is the process of finding and agreeing to the terms of a purchase. It includes identifying potential suppliers, negotiating contracts, and selecting the supplier that offers the best value for money. Purchasing is the actual act of buying goods and services.

<u>Business Framework</u>:   A business framework is a process and fundamental base of what operating strategies guide a business or organisation. A business framework is a process and fundamental base of what operating strategies guide and business or organisation

<u>Public-Private Partnership</u>:   Public-private partnerships involve collaboration between a government agency and a private-sector company that can be used to finance, build, and operate projects, such as public transportation networks, parks, and convention centres

<u>PCP</u>:   Pre-Commercial Procurement is the procurement of research and development of new innovative solutions before they are commercially available. PCP works in conjunction with Public Procurement of Innovative Solutions (PPI).

<u>PPI</u>:   Public procurement of innovative solutions happens when the public sector uses its purchasing power to act as early adopter of innovative solutions which are not yet available on a large scale commercial basis.

<u>CP</u>:   Commercial Procurement procurement means the purchase of research services of which all benefits accrue exclusively to the contracting authority or contracting entity, and which it may use in the conduct of its own affairs on condition that it fully remunerates them

<u>TRL</u>:   Technology readiness levels are a method for estimating the maturity of technologies during the acquisition phase of a program. TRLs enable consistent and uniform discussions of technical maturity across different types of technology.[1] TRL is determined during a technology readiness assessment (TRA) that examines program concepts, technology requirements, and demonstrated technology capabilities. TRLs are based on a scale from 1 to 9 with 9 being the most mature technology.[1]

<u>OpEx</u>:   Operational Expenditure An operational expenditure (Opex) is the money a company spends on an ongoing, day-to-day basis in order to run a business or system. Depending upon the industry, these expenses can range from the ink used to print documents to the wages paid to employees

<u>CapEx</u>:   Capital ExpenditureA capital expenditure (Capex) is money invested by a company to acquire or upgrade fixed, physical, non-consumable assets, such as a building, a computer or a new business.

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01   INTRODUCTION

DiSSCo Prepare WP4 (led by MNHN, Paris) aims to prepare a business model for the future DiSSCo Research Infrastructure (RI). This business model will ultimately describe the added value that the DiSSCo RI will bring to the consortium, its stakeholders and society in general, within Europe and beyond. The sustainability of the DiSSCo business model rests on the basic assumption that the added value generated by the consortium will at least match , and most likely exceed , the public investments by the member states. It is important to note that the fundamental ambition of DiSSCo is well beyond the mere commercial value of its activity. For example, the delivery of less-financially evaluated results, such as scientific breakthroughs, will also flow from DiSSCo. And next to public research support, DiSSCo has the ambition to **strengthen collaboration with industry** to **support European RD&I processes**.

Figure 1 provides a general overview for the business model as it is currently conceived in WP4. The WP4 tasks focusing on the conceptualisation of the different aspects of the model are indicated in yellow. The model covers aspects of both funding or income and expenditure or cost. The DiSSCo Hub is central in the model, and will act as the central coordination office of the DiSSCo RI, that next to coordination, will also serve as other functions that have to be decided upon (the delimitation of the hub is a work in progress). DiSSCo services and activities (including financial operations such as running **procurements**) may be partly centralised in the Hub (see discussion below) or distributed (i.e. delivered by Member and Associated States, by member institutions or by operational units). This DiSSCo Hub and its core activities & e-services will have fixed costs that will be financed through: (1) fixed funds from the Member States (national contributions), (2) variable income from projects, and (3) income from the users of the DiSSCo e-services.
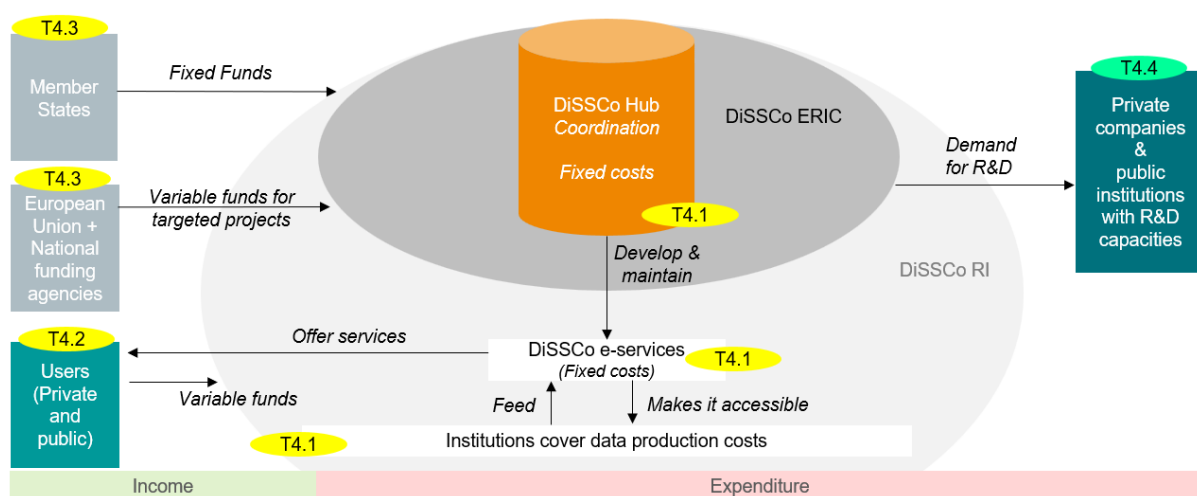

Figure 1. General overview for a business model for the future DiSSCo RI (source: MNHN).

Relevant for task 4.4 is that DiSSCo wants to **invest in research and innovation**, to benefit the DiSSCo consortium, as well as other stakeholders, including society. This will be done through partnerships between the DiSSCo consortium and third parties, enabling innovation beyond the field of expertise within the consortium. These diverse partnerships will allow public procurers , be it the DiSSCo central hub or the separate institutions , to buy research and development (R&D) from suppliers in competition with one another , these can be private companies and/or public institutions with R&D capacities.

Task 4.4 is evaluating the potential benefits of Commercial Procurement (CP), Pre-Commercial Procurement (PCP) and Public Procurement of Innovation (PPI) for DiSSCo. Specifically in relation to the procurement of research and innovation, CP can be ruled out; although in the wider context of general purpose procurement, CP may have a role. In any case, we should also keep an eye out on where and when to best apply the guidelines of Green Procurement[2]. Furthermore, It is now clear that the utility of PCP and PPI, and any potential benefits they may have, need to be carefully considered. Neither PCP nor PPI is a panacea for all procurement challenges. PCP is defined as procurement of R&D services involving risk-benefit sharing[3] under market conditions and competitive development in phases[4]. PCP focuses on the R&D phase before wide commercialisation. PPI is similar to PCP but relates to scale-up activities for market-ready innovations rather than R&D risk-sharing. Starting with setting PCP and PPI in the wider context of procurement in general, we present here our findings and consider our next steps

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[2] https://ec.europa.eu/environment/gpp/index_en.htm

[3] Risk-benefit sharing under market conditions refers to the PCP approach in which procurers share with suppliers at market price the risks and the benefits related to the IPR resulting from the R&D.

[4] Competitive development in phases refers to the competitive approach to buy the R&D from several competing R&D providers in parallel and to compare and identify the best value for money solutions on the market to address the PCP challenge. To reduce the investment risk for the procurer, reward the most competitive solutions and facilitate the participation of smaller innovative companies, the R&D is also split into phases (solution design, prototyping, original development and validation / testing of the first products), with the number of competing R&D providers being reduced after each phase

02   PCP and PPI in the Procurement Context

Procurement is a complex commercial process that is heavily regulated. As a result, procurement is carried out within tight organisational constraints and is seen as a significant overhead for any organisation, private or public. For this reason, a number of procurement models have been developed: all have pros and cons attached to them, these change by context and are difficult to tabulate in any generally meaningful manner (Table 1). In 2007, the European Commission (EC) introduced two types of procurement[5] (PCP and PPI) aimed to seed marketplace innovation through commercialising some aspects of the research "pipeline". These initiatives are expected to encourage the support of development (PCP) and uptake of near-market-ready innovations (PPI) through offering public and private entities alternatives to standard commercial procurement processes. These alternative approaches satisfy a need to fill capability gaps in organisations that rely on the adoption of novel solutions to enhance gaps in product/service portfolios that they are unable, for any reason, to develop for themselves.

Table 1. Rules, opportunities and challenges of different procurement strategies.

	Pre-Commercial Procurement	**Public Procurement of Innovation**	**Standard Procurement**
Rules	Laws & Regulations **TRL 1-8** Specific Guidelines	Laws & Regulations **TRL 8-9** Specific Guidelines	Laws & Regulations **TRL 9<**
Opportunities	**Outsource** research Create innovation Distribute the risk	**Buy in** innovation Early adoption supports developers	**Reduce overheads** CapEx vs OpEx Supply-chain Management
Challenges	Managing the process **Scope setting** Specifications Selection	Managing the process **Matchmaking** Specifications	Managing the process **Specialised Skills** Specifications

Both PCP and PPI are forms of procurement and procurement itself is set within the wider context of a product/service lifecycle. It is of value for DiSSCo to consider these wider contexts within the development of strategic planning that underpins the evolution of the research infrastructure: organisational strategy should be the initiating source of any procurement activity.

The difference in applicability of these procurement schemes in function of the readiness of the explored solution or its Technology Readiness Level (TRL), as depicted in table 1, is visualised here below in figure 2.
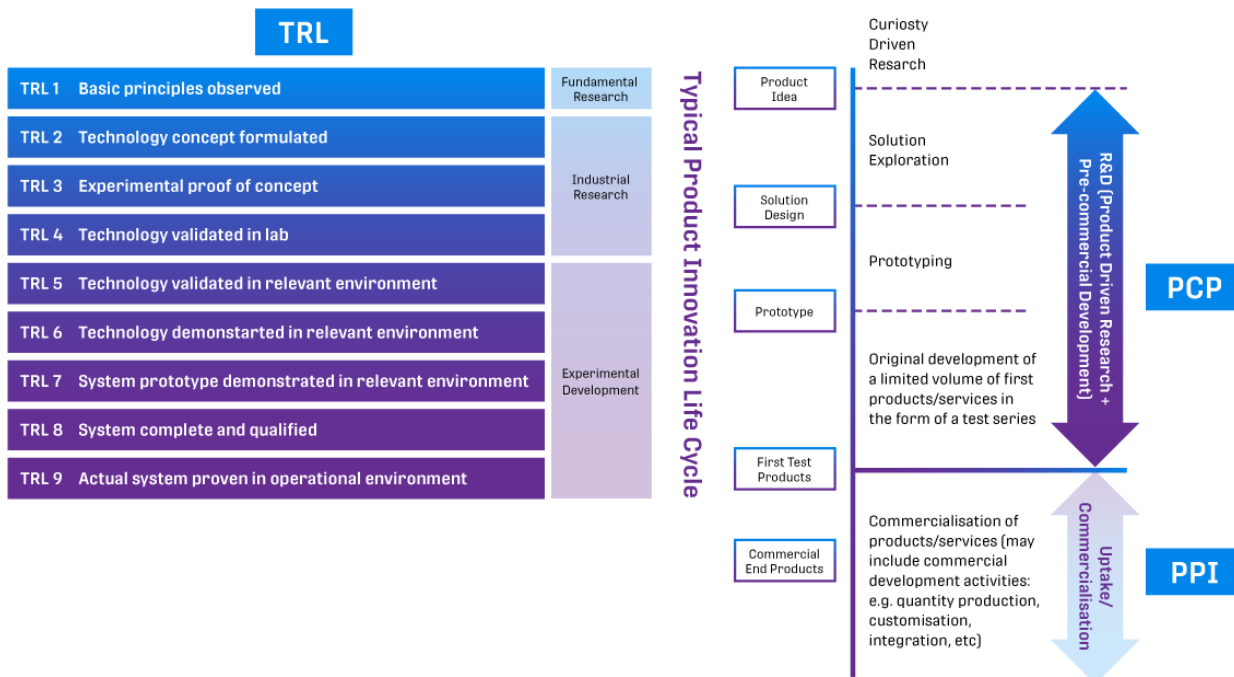
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[5] https://www.kowi.de/Portaldata/2/Resources/fp/fp-pcp-brochure.pdf"

Figure 2. PCP and PPI in the TRL order (source: https://carematrix.eu/pcp-process/).

Organisation of Procurement

Procurement activities can be organised through **different models**. In large commercial organisations it is often established as a **central activity** (Figure 3: Centralised Dedicated) run as a cost centre in the business core . However, in a partner led organisation, such as DiSSCo, a dedicated procurement function may be too expensive to justify, at least initially. In this case, the centralised procurement function **could be delegated** (Figure 3: Centralised delegated) to one of the DiSSCo partners (institutions, countries or consortium of multiple institutions) , possibly on a rotating basis like the EU presidency. It is also possible for procurement activities to be undertaken in a distributed manner, where small entities, which share similar requirements in the product/service they wish to procure, get together to save costs. Such an organisation can be difficult and time-consuming to manage, especially if partner requirements start to drift during the specification stage. The organisation of distributed procurement can be conducted on an ad hoc, project by project, contract by contract basis (Figure 3: Distributed ad hoc), or it can be semi-formalised through the creation of a networked procurement "cluster" (Figure 3: Distributed Networks).

Figure 3. Procurement Styles

Table 2. Rules, opportunities and challenges of distributed and centralised procurement

	Individual/Distributed Procurement	Centralised Procurement
Rules	Laws & Regulations	Laws & Regulations Agreements
Opportunities	Reduce overheads Fast Decision-making	Economies of Scale Expertise Skills Robust Specifications Commitment Solid Process
Challenges	Complexity of process Divers Specifications Differing and shifting perspectives	Admin cost of group Slow decision-making

The authority launching the procurement can also be the European Commission itself on behalf of the Research Infrastructure, especially if the EU itself is a potential user or stakeholder of the end products. In this case the procurement facilities and services of the EU are used as a partnership with the RI for example. See the Joint Procurement launched by the European Commission launched in June 2022 for the implementation of the European Open Science Cloud (EOSC) using this approach[6].

Regardless of the way in which procurement is carried out by a public organisation, the procurement process is heavily regulated and must meet specific legal requirements which differ between jurisdictions. The EC has devised forms of procurement that organisations can deploy where commercial procurement (CP) is not sufficiently flexible to satisfy requirements. As in essence , CP applies to a product/service already in the market. These forms of procurement are PCP[7] and PPI[8]. PCP is designed to allow experienced developers to work out client ideas into marketable products or services. PPI is designed to help organisations with market ready products/services to scale up their delivery mechanisms from low production levels to high production levels capable of meeting real-world market demand. Legal assistance is available for those wishing to deploy PCP and PPI procurement: the European Assistance for Innovation Procurement (EAFIP) initiative supports public procurers across Europe in developing and implementing innovation procurement[9].

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[6]
https://ec.europa.eu/newsroom/repository/document/2022-25/EOSC_Public_Procurement__Action_0fFdRXFWvmZ94W1OCjeFoZhkTuE_87799.pdf
[7] https://digital-strategy.ec.europa.eu/en/policies/pre-commercial-procurement
[8] https://digital-strategy.ec.europa.eu/en/policies/ppi
[9] https://eafip.eu/

PCP is only part of the story

So far, we have considered procurement in isolation; however, procurement is one step in a wider product/service purchasing and operating process (Figure 4). Payment is another important step. At the organisational level, incoming and outgoing payments have to be considered.

- (Outgoing) Payment for a product/service for deployment by the organisation: 1-1, even if payment is by instalments
- (Incoming) Payment to the organisation for access to the deployed service by end-users: 1-n or even n-m payments, if multiple services and partners are involved in product/service delivery.

As well as considering the scaling of the payment and accounting system to meet user demand, there are other issues to consider. Notable among these other issues is that of cross border payment. Cross border payments can be problematic, incredibly so in the case of incoming payments. Issues to consider include:

- Tax differences between member states
- Legal differences between member states
- Regulatory differences between member states

Overcoming such challenges, like those associated with procurement can be overcome: it is expensive but not impossible. Large companies like Amazon can afford to do it but publicly funded entities find it difficult to follow a pure commercial model as the costs are difficult to justify in this context. Novel solutions are needed and, if devised, some collective lobbying at the EC may result in a positive outcome as the EC is aware of the problems and it wants to help.
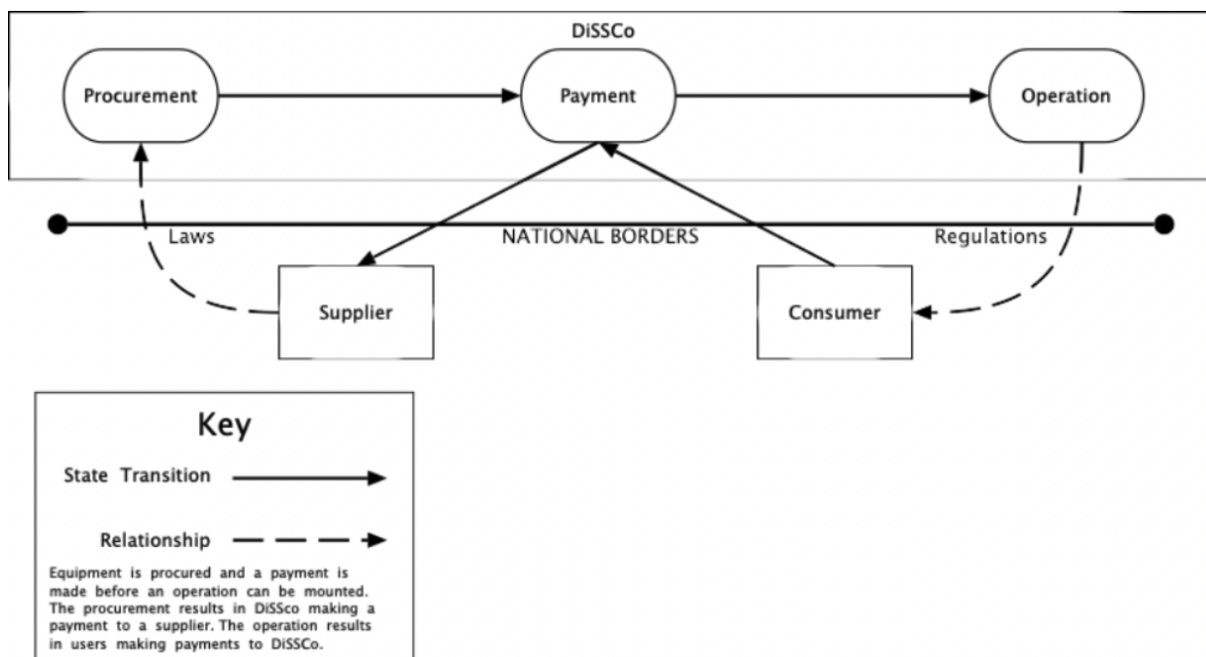

Figure 4. Purchasing

PCP is part of a larger story

Purchasing is part of an even wider product/service lifecycle. Products and services both require raw materials that are obtained from natural resources. These are processed and have value added until the product or service is of merchantable quality. Products and services are then sold and operated, consuming other resources during the operational phase. When products and services are no longer required, they are disposed of. Increasingly, there is an expectation that disposal will involve some degree of recycling.

Figure 6. Environmental impact of EU consumption using Life Cycle Analysis (LCA) (Source: https://eplca.jrc.ec.europa.eu/lcProjects.html)

The EC is moving towards a fully circular economy with environmental and carbon footprint becoming ever more important in the decision-making around all aspects of the product/service lifecycle. It may be prudent for DiSSCo to take the issues into account in its deliberations over procurement. Recent global socio-economic real-politics has intervened in the EC's ambition to achieve Green Deal targets and harsh decisions have had to be made. These have resulted in actual harm being inflicted in Green Deal fulfilment targets, with accompanying negative economic impact. It is good practice to assume that publicly funded entities will be expected to work harder to try to mitigate these negative impacts. DiSSCo strategy development might study how it could contribute here by considering product/service acquisition and operation from a wider lifecycle perspective.

The EU has here introduced the principle of Green Public Procurement[10] as a voluntary instrument, which considering its scope, we feel DiSSCo should incorporate.

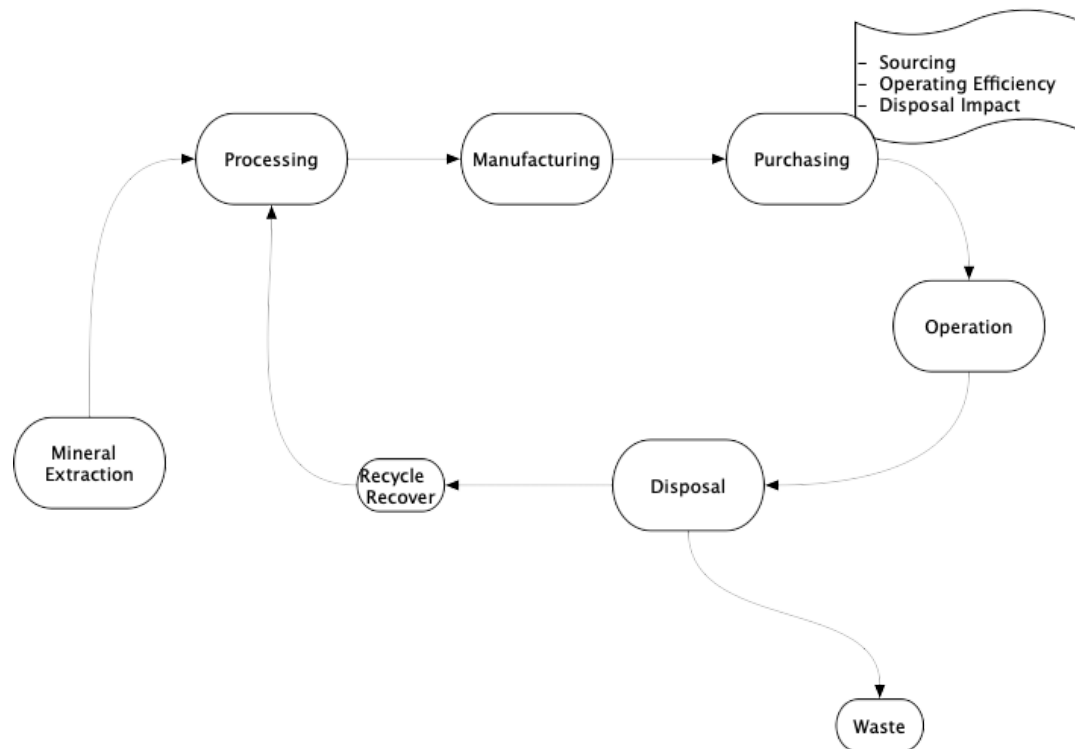[10] https://ec.europa.eu/environment/gpp/index_en.htm

Figure 5. Situating procurement in the Product LifeCycleAnalysis in the DiSSCo landscape

Constraints and limitations

Finally, it is important to recognise that PCP and PPI are frameworks put in place to increase market opportunities for suppliers, not customers (in this case DiSSCo) or the consumers of their products/services.

They are not mechanisms that allow customers/consumers of products/services to increase their incomes or to access new ways of selling their own products/services back into their own communities.

Avoiding real and potential or even imaginary[11] Conflict of Interest (CoI) is of critical importance in the purchasing process. To illustrate, in a call for Innovation, a PCP can occur, if applicable, however an initiated PCP does not double back into a call for innovation to cover the time and effort dedicated to get a PCP up on the rails.

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[11] Even if a CoI can be demonstrated to have not impacted on the purchasing process, or to not have taken place at all, the costs of proving this legally can be ruinous. It is best to avoid any possible misinterpretation of CoI in the purchasing process.

03   A TYPICAL PCP/PPI/CP PROCESS

Here we consider the procurement process, focussing on PCP but not disconnected from CP and PPI as in many cases the purchasing requirements of DiSSCo will be best met through CP (e.g. there is no need to run a PCP competition for stationery cupboards or to configure and implement an existing IT package), or PPI (e.g. to scale a 3D visualisation technology where low volume products are available). The steps described below refer to Figure 6 which is offered as a nominal example of a procurement process model.
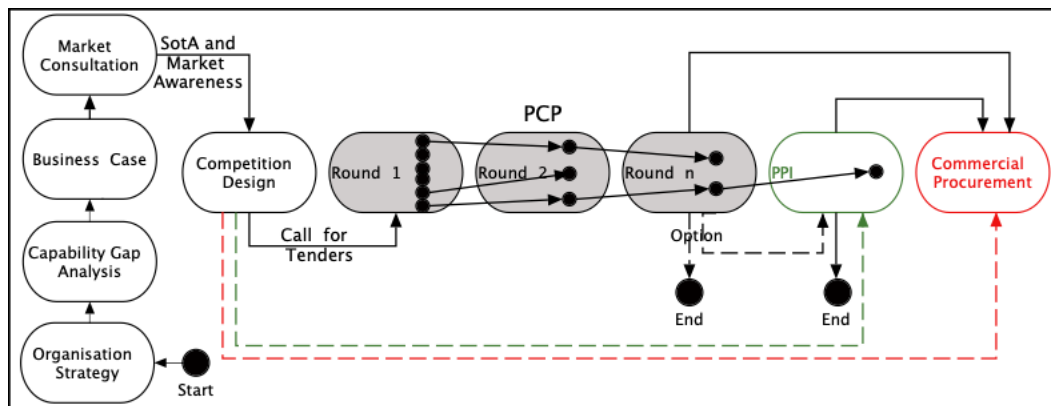

Figure 6. Procurement Process

DEFINE STRATEGIC REQUIREMENTS

All procurement decisions need to be based on the overarching organisational strategy. By tying in the procurement strategy closely to the organisational strategy, we enable strengthening of strategic partnerships. The strategy will be based upon Business plan and Business model. Requirements will be based upon a current market analysis and examination of the current service catalogue, which will be compared to each other to develop a gap analysis, leading to the identification of a number of potential opportunities.

DEFINE BUSINESS CASE

For each opportunity, establish whether the use of PCP, PPI, or CP are suitable for the acquisition of the missing capability required to fill the gap. If PPI or CP are determined to be the most suitable procurement mechanism then do not proceed with PCP procurement. Instead follow the corresponding procurement rules for that specific procurement scheme.

MARKET CONSULTATION

In all procurement scenarios, it is important to understand what is available in the market. In the case of PCP, the market has to be considered from two perspectives: what research is out there which can help fill my capability gap and who will use this product/service if my PCP funds its market introduction?

An assessment of the current State of the Arts (SotA) is then carried out, this applies to all of the entities revealed in the market study: this SotA applies to the entity itself as well as its results/product/service.

COMPETITION DESIGN

Once the maturity of the businesses and their offerings are understood an initial sift of possible contenders for the PCP competition can be assembled. Success criteria round quotas for early rounds of the competition should then be developed and a Call for Tenders (CfT) prepared along with materials to publicise the PCP competition.

MANAGE COMPETITION

The CfT is issued to initiate the competition. After the deadline passes, select the solutions that best meet the success criteria , to fill the initial round quota. Issue PCP competition contracts with requirement specifications to the winners and run the initial round of the competition.

After each round, select the proposals that best meet the success criteria, eliminate those that do not meet success criteria and fill the quota of that round. Run successive rounds, with tightening success criteria and lower quotas. Continue until at the end of the final round, there are only solutions left that meet the success criteria : the winners. Initiate a procurement contract to the selected solution, or alternatively, initiate a PPI contract with the winner and then initiate a procurement contract with them[12].

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[12] PCP provides for a novel means of procuring pre commercial products/services. Effectively, a Minimum Viable (or single instance of a) Product/Service is created. For a greater capacity to be procured, a longer-term relationship and/or contract needs to be established between DiSSCo and the provider that completed the PCP competition. Establishing a contract with the successful provider to supply ongoing products/services to DiSSCo can be achieved through a straightforward commercial contract or initiating a PPI if it is felt that more development is required to strengthen the product/service for full commercial deployment.

04   RELEVANCE OF CP, PCP, PPI

As mentioned earlier, building the procurement approach on the DiSSCo Strategy will facilitate strategic partnerships in the long run. For the future DiSSCo RI, the strategic requirements are conceptualised into four strategic programmes that cover the majority of the RI activities. These include:

1. **Digitisation** programme. Goal: Accelerate and lower barriers for digitisation across European Natural History Collections.
2. **Access** programme. Goal: Create, measure and support multimodal standardised routes to access collections
3. **Capacity Building** programme. Goal: Ensuring that users and partners are confidently supplying/using data through DiSSCo and are making use of DiSSCo's services
4. **e-Services** programme. Goal: Development of e-Services based on user needs defined through engaging with our stakeholders

In order to gain insights on which strategic programmes foresee development needs, either in-house or via external partners, and would eventually engage in some kind of procurement, a survey was completed by 3 WP's leaders, representing the WP's Human Resources, Training and Users Support, Capacity Enhancement and Common Resources & Standards) and 10 individuals representing 14 DiSSCo Prepare tasks[13]. Specifically the task leaders of tasks:

- 1.2: Analyse Earth Sciences use cases and user stories
- 1.3: Establish Relevant criteria to identify a prioritisation model for digitisation
- 1.4: Develop indicators of socioeconomic impact
- 2.2: Helpdesk and user support services
- 3.2: Collate, refine and implement best practices for data mobilisation at the institutional level to develop the DiSSCo plan for data mobilisation and curation pipelines
- 4.2: Cost model for charging services
- 4.4: pre commercial procurement financial structure
- 5.1: DiSSCo Knowledge Base for technical development
- 5.2: DiSSCo Modelling Framework and Data Model
- 5.4: Modernising technical infrastructure for science data mobilisation and publication
- 6.3: Technical interface requirements for the end-user services
- 7.3: Develop and establish DiSSCo policies
- 8.3: DiSSCo stakeholder engagement
- 9.4: Compilation of DiSSCo Construction Master Plan

These answers enabled us to locate where PCP might be applicable and drill deeper into those opportunities. For tasks 1.3 and 9.4 no new development was foreseen, in tasks 1.4, 2.2, 4.4 and 5.4 there was uncertainty at the time of the survey and in tasks 1.2, 3.2, 5.1 and 6.3 the representatives indicated that development was foreseen in the (near) future. Most of them saw in-house development as the way forward. However tasks 2.2, 3.2 and 6.3 indicated a need for collaboration with external partners through procurement.

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[13] https://www.dissco.eu/dissco-prepare-work-programme/

Further insights on which development needs would benefit from PCP, PPI or CP were gained during a session on the 2nd DiSSCo prepare all-hands-meeting. This resulted in three well-defined development needs for which there is PCP potential:

1. **Mass Digitisation** of specimen in liquid and of anatomical structures
2. **Collection Management** System in the cloud and using FAIR Digital Objects
3. **Data Enhancing** Annotation and Curation through Machine learning/experts.

It should be noted that the results of this survey and further insights are not to be regarded as final as more development needs will most likely emerge in the future.

DiSSCo PROCUREMENT ORGANISATION

We further explored the potential for individual/distributed or centralised procurement, in particular within the framework of an ERIC. Some perspective was gained during a dedicated session on 'Strengthening Partnerships by building a Procurement Strategy' during the Funders Forum on 17 June 2022. Further work will focus on:

1. investigating procurement potential in the above mentioned domains. This work includes the achievement of strategic perspective (i.e. fit with the four strategic pillars of DiSSCo),
2. issue a Prior Information Notice (PIN) with a refined scope of the proposed development,
3. performing a gap analysis to track existing solutions and their TRL levels to define the preferred procurement strategy (PCP, PPI, standard procurement),
4. investigating funding approach options such as centralised, decentralised, hybrid procurement approaches.

EU FUNDING OPPORTUNITIES

There are **European funding opportunities** where **PCP** can be part of. These include the HORIZON Research and Innovation Actions (HORIZON-RIA)[14]. The aim of HORIZON-RIA's is to deliver innovative scientific instrumentation, tools and methods, which advance the state-of-art of European RIs, and show transformative potential in RIs operation. The related developments should underpin the provision of improved and advanced services, lead research infrastructures to support new areas of research and a wider community of users, including society and industrial users.

Proposals of RIA's may include PCP subcontracting activities, encouraging the use of public procurements for the competitive development of new specific solutions, whilst opening market opportunities for industry and researchers active in Europe.

By establishing the procurement process in consecutive phases, the PCP activity can support the development of competing designs, prototypes, and solution testing.

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[14] See for example the call "Next generation of scientific instrumentation, tools and methods, and advanced digital solutions for RIs" (2024) HORIZON-INFRA-2024-TECH-01, https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/horizon-infra-2022-tech-01-01)

05 PROGRESS AT MS 4.4

The study into the suitability of PCP and the other procurement strategies deemed suitable for DiSSCo, and how DiSSCo might take advantage of them, is now complete.

The results of this study have been shared with the consortium (in the all hands meeting, at the funders forum, at internal meetings with WP4 leader and CSO). These will be further refined with the input from the consortium. This milestone document goes some way to achieving this goal. However, additional training material and information sharing resources may be developed if required and these will be distributed amongst the partners.

In order to perform these analyses and formulate preliminary recommendations, we have largely made use of the resources, documents and examples provided by the European Commissions of procurement. We also had access to procurement examples and analysis in agreement with the European Open Science Cloud EOSC, which were very valuable resources to progress. In this regard DiSSCo and the domain of Biodiversity information is one of the Case studies towards the implementation and sustainability of the EOSC in the future. This resulted in a mutual benefit for both sides. We did analyse in more details existing procurement and their outcomes such as:

- EOSC Procurement - Preliminary Market Consultation Report[15]
- The PREFORMA project PCP (2017) Towards a sustainable ecosystem for long term digital preservation of cultural heritage[16].
- The Archiver Pilot on Archiving and preservation for research environments (June 2022) which is in its PCP end-phase[17]and the very clear and informative slide deck documenting the whole PCP process[18]

In the final deliverable, we aim to provide a roadmap for DiSSCo within the EU PCP framework. This will have a strong connection to the DiSSCo Strategy that is developed in DiSSCo Prepare. We believe having a clear procurement strategy for development is essential to create and strengthen both internal and external DiSSCo partnerships. A clear overall strategy enables us to apply a consistent filter to opportunities for development and procurement, in line with the funders vision. As underlying principle, one can consider the benefits of a prior agreed commitment strategy vs a costly punishment strategy[19].

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[15]

https://digital-strategy.ec.europa.eu/en/news/open-market-consultation-european-open-science-cloud-public-procurement-action

[16]

https://digital-strategy.ec.europa.eu/en/news/towards-sustainable-ecosystem-long-term-digital-preservation-cultural-heritage

[17] https://www.archiver-project.eu/archiver-pilot-end-phase-event

[18] https://www.archiver-project.eu/sites/default/files/Archiver_PilotEndPhase_SingleSlide.pdf

[19] https://www.nature.com/articles/srep02695

DiSSCo
PREPARE