ProeHealth-enhancing procurement of ICT solutions for healthcare: **Steps for effective procurement**

ProeHealth is a study on enhancing procurement of ICT solutions for healthcare[1]. The context of the study is the promising role that eHealth can play in protecting healthcare system values such as universality and equal access in view of the widening gap between demand for healthcare services and resources for their supply, and the complexity of eHealth markets and of procurement processes therein.

The aim of the ProeHealth study is to enhance the procurement of ICT solutions for healthcare by providing guidelines to decision makers and procurers within public healthcare authorities and care delivery organisations. The guidelines are to help them to conduct consistent and systematic planning processes when strategic considerations point to adopting eHealth solutions and how to transfer the planning to the procurement specification and process.

In order to produce these guidelines the ProeHealth study selected five initiatives of procurement of regional EHR systems, one initiative of procurement of a regional PACS system and four cases of telemonitoring services in the context of specific chronic disease management programmes run at the level of a regional health authority or a wide-area local health authority. These initiatives form ten good practice case studies which provide the basis from which to draw guidelines for procurement.

Guidelines

Thirteen guidelines were produced based on the lessons of the case studies. The lessons cover different elements of the procurement process with illustrative examples from the case studies. For ease of use the guidelines have been transformed into a step-by-step guide for procurers and decision makers into a step-by-step guide to creating effective procurement processes for eHealth solutions. For the full guidelines please see the final report at www.pro-ehealth.eu

10 Case studies

An overview of the ten selected ProeHealth good practice case studies please see below. For each case an extensive case study has been preparedand is available at the proeHealth website www.pro-ehealth.eu .

[1] ProeHealth - study on enhancing procurement of ICT solutions for healthcare is commissioned by the European Commission Directorate General for Communications Networks, Content and Technology, and is carried out by the European Connected Health Alliance (Northern Ireland, UK) and empirica Gesellschaft für Kommunikations- und Technologieforschung mbH (Bonn, Germany). Although the study is funded by the European Commission, the views expressed in this report are those of the authors and do not necessarily reflect those of the European Commission.

Figure 1: ProeHealth selected good practice case studies

eHealth Solution	Case	Procurer	Country
EHR	Uppsala EHR	Landstinget I Uppsala län [Uppsala County Council]	Sweden
EHR	TreC	Provincia Autonoma di Trento (PAT) [Autonomous Province of Trento]	Italy
EHR	Estonian EHR	Sotsiaalministeerium [The Estonian Ministry of Social Affairs]	Estonia
EHR	Solimed	Solimed – Unternehmen Gesundheit GmbH & Co. KG [Solimed Health Company Ltd] A network of private GP and specialist practices	Germany
EHR	Northern Norway EHR	Helse Nord [The Northern Norway Regional Health Authority]	Norway
PACS	Catalonia PACS	Generalitat de Catalunya Departament de Salut [Catalonian Public Health Department]	Spain
Telemonitoring	Whole System Demonstrator (WSD) Pilot Programme	Procurement was undertaken by three demonstrator sites at Cornwall, Kent and Newham. Each site involved a large number of stakeholder organisations, plus a variety of other parties and key partners, see Annex for details.	UK
Telemonitoring	Remote Telemonitoring Northern Ireland (RTNI)[2]	Northern Ireland Government Department of Health, Social Services and Public Safety (DHSSPS);	Northern Ireland
Telemonitoring	Municipality of Trikala Telemonitoring	Ο Δήμος Τρικκαίων [The Municipality of Trikala]	Greece
Telemonitoring	Herz AS	AOK Nordwest [a public health insurer in Northern Germany]	Germany

[2] While preparing this report, RTNI has been rebranded to "Telemonitoring NI", see http://www.northernireland.gov.uk/index/media-centre/news-departments/news-dhssps/news-dhssps-121211-poots-launches-18m.htm

Steps for effective procurement

Step One: Analyse the market

The maturity of the market and the limits of the geographical region should be borne in mind when considering the approaches to take to procurement. Therefore market analysis should be carried out before the design of a procurement process. This should include:

1. Getting to know the market players and their areas of expertise,
2. Analysing what is currently available on the market,
3. Researching what other sites have deployed, particularly those with similar infrastructure, health systems and facing similar challenges,

    For example for the Northern Norway EHR highly detailed information was gathered from other Norwegian sites.

Step Two: Assess the strategic setting

In order to identify the needs of the healthcare system and the possible role eHealth could play within it an assessment of the strategic setting needs to be carried out. Assessing the strategic setting requires analysis of the local healthcare system; its strengths and weaknesses. This analysis should derive from input by key stakeholders. Existing policy directives should be considered in this assessment as should the existing legal framework and the limitations it may impose on eHealth solutions.

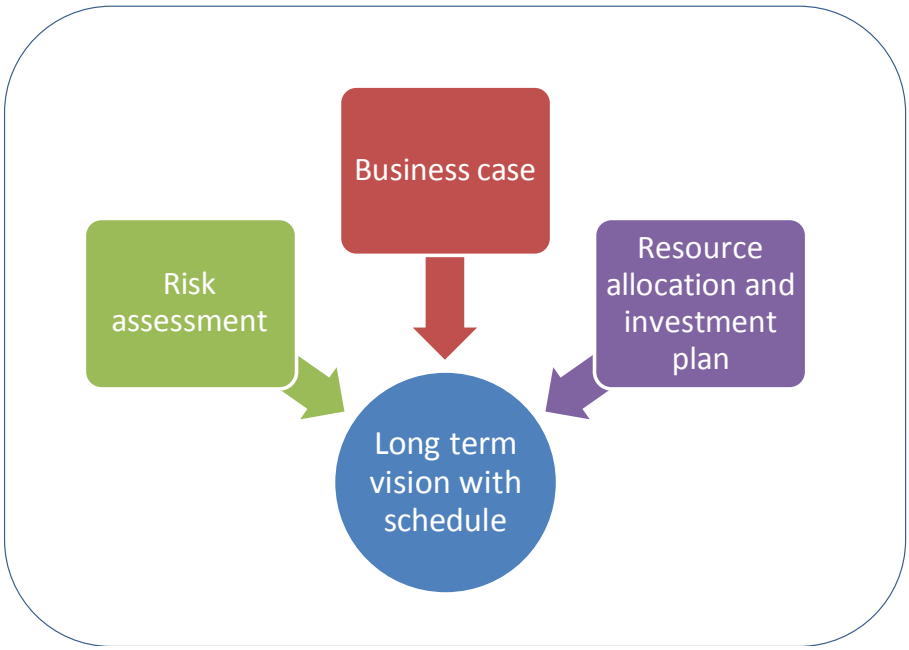
Generally eHealth projects are initiated by an aspiration to improve the quality of service provision. In order to achieve such an aim it is not possible to merely renovate one link of the service delivery chain, even if this is the only link for which elements are being procured. If one link is modified but the others remain as they were they will no longer fit together. Therefore, the processes of the entire chain need to be overhauled so that all the links fit together and work well. Assessing the strategic setting consequently applies to the entire healthcare delivery system.

Engage with the market via informal enquiries such as open days. This has a twofold advantage: it will not only provide opportunity for commissioners to expand their market knowledge base but it will also alert procurers to the coming investment so they are poised to engaged. In some case studies the lack of initial market response temporarily hindered the procurement process. For example, in Trikala it was discovered that the market was limited by the underuse of telemonitoring in Greece and the difficulties of a non-Latin alphabet posed by the Greek language. Many of the larger, international players were not interested in this opportunity and so did not respond.

Step Three: Establish strategic planning

It is imperative that a clear strategy is formulated at the start of a project to ensure the smooth running of a project and to be able to assess the achievement of project objectives and benefits. This involves a risk assessment, resource allocation and the development of a business case and investment plan. An envisaged timescale and schedule will be developed as a result of these activities. When planning the schedule conservative estimates should be made as well as flexibility allowed for possible disruptions and contingencies. A long term vision also needs to be taken into account, with plans for alterations, additions and improvements which will need to take place post implementation of the eHealth solution.

Figure 2: Elements for strategic planning of eHealth procurements



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Establishment of organisational, management and reference teams is required during this phase as is the development of supervisory stakeholder groups and steering committees. It is essential that a committed and multi-disciplinary team for project management is in place by this stage. One of the elemental tasks of the project team should also be implementation of the schedule and regulating adherence to it.

Step Four: Design an investment brief

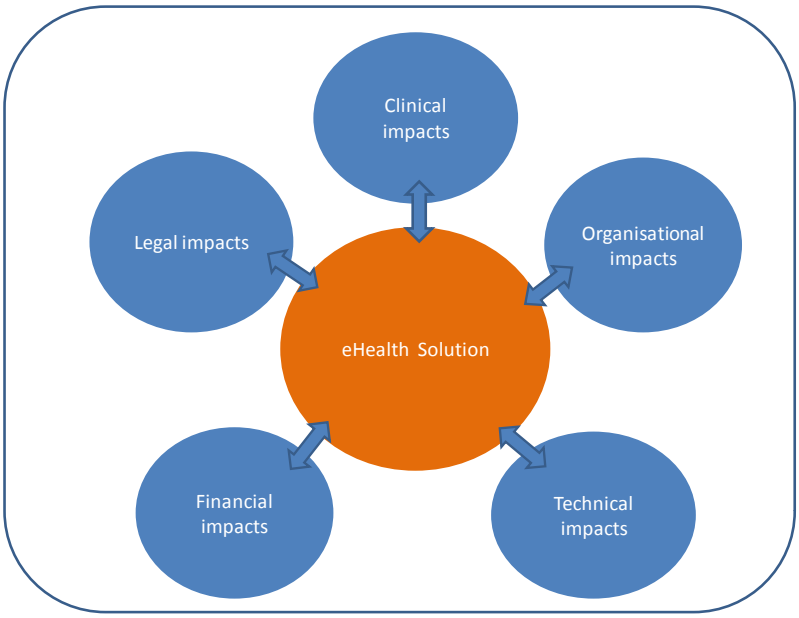
From the considerations of the previous steps an investment brief can be established which describes:

- the area of healthcare organisation the eHealth solution will target,
- the improvements expected,
- the scope of the solution,
- the target users,
- the patient groups who will be impacted,
- links to any other solutions,
- the anticipated financial volume of the investment
- the designation of process owners and decision makers.

Step Five- Design the solution and plan for service modifications

The next stage in the procurement process is the design phase. This can be considered as being made up of five elements: clinical, organisational, legal, financial and technical. The design stage includes consideration of how these areas will be impacted by the introduction of the eHealth solution and conception of modifications in order to adapt to these impacts. Attention to detail and consultation with stakeholders is essential at this stage. Every aspect of the eHealth solution's impact on service delivery needs to be taken into account and prepared for to ensure smooth operation post solution implementation.

Figure 3: Impact considerations for the introduction of an eHealth solution



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Clinical design impacts

This will include changes to methods and means of working among medical and associated staff such as changes to clinical procedures, including tests; diagnosis; prescribing, ordering and administering medications and treatment procedures; therapies; referrals; nursing plans; care pathways. As any adjustments will directly affect clinical, administrative staff and patients it is therefore good practice to include staff in the design process.

Organisational design impacts

Organisational changes will include alterations required to interactions between teams within the healthcare organisation as well as to their areas of responsibility, capacities and work flows due to the implementation of the eHealth solution. Again, it is good practice to include users when making amendments to their workflow so as to ensure best design and acceptance. Not only users should be involved but all stakeholders should have some form of representation. As has already been outlined, an eHealth procurement will affect the entire healthcare delivery chain and therefore stakeholder representation in the decision making process is essential.

Legal design impacts

Design of legal aspects includes consideration of how the legal and regulatory framework will affect, or even steer the design of the eHealth investment. Rights, obligations and liability of healthcare organisations, teams and professions should be considered. In particular, confidentiality and security of information, the role of professional bodies and their self-regulatory frameworks and the practices of professionals. Although it may be that the law may requires an update to meet the challenges that occur alongside the benefits when introducing eHealth. Such as in Trento where privacy laws have had to be developed in order to govern the access rights of carers.

Previously in Norway the law did not allow data to be accumulated for multiple legal units and access to data between legal units could only be conducted by means of electronic messaging. Therefore the vision for information sharing developed in the Northern Norway case study would be considered illegal. However, it was realised that this restriction was disruptive to developing good treatment processes between legal entities, such as hospitals. Therefore, these conditions changed in 2012 and allow for the kind of information sharing envisaged by the project and so the procurement was able to proceed.

Financial design impacts

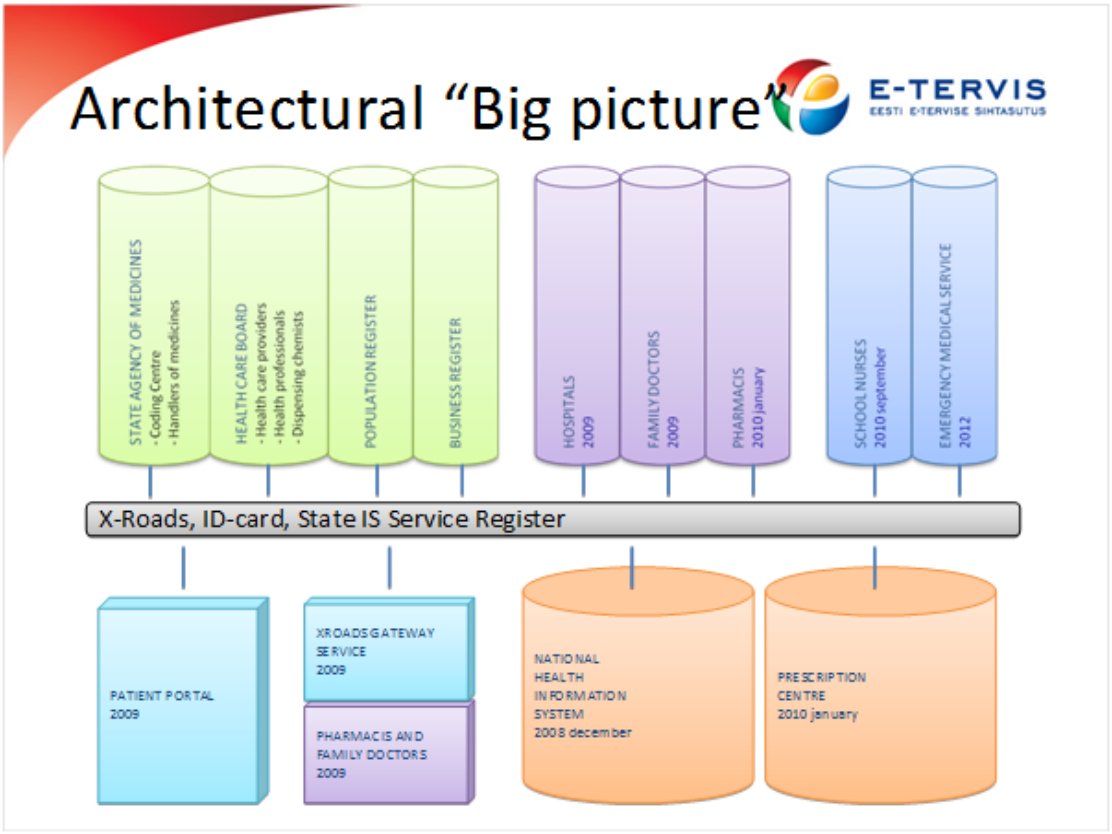
Financial elements which need to be considered in system design include clarification of the impact on income and expenditure, as well as capital investment. Affordability and investment / risks should be assessed as the design elements unify into system specification.

Technical design impacts

The technical characteristics which should be considered in solution design include information requirements, functionalities, technical architecture and technology. Information requirements should be definitions of the information types and links, as coming from the clinical procedures and organisational changes. One example of this is information sharing such as clinical information about the patient, information about resources available and information about clinical best practice. Functionalities are what the technology has to be able to do in order to meet the information requirements. The technical architecture is the formalisation of how information requirements are fitted into functional components and capabilities. Developing a clear picture of the technical architecture is essential for a successful procurement in order to ensure effective planning and management and most importantly a functioning and efficient solution, an example from the Estonia case study is presented below. If appropriate, an analysis of the existence, functionality, interoperability and maturity of legacy systems should be conducted. This means that consideration is given to avoiding dependency on the future of certain vendors. Software should be developed which is not limited in its use to certain providers solutions and interoperability is ensured. One means of doing this is through the use of standards, another way is through design requirements which specify the ability to integrate with other systems.

Technology considerations include selection of the hardware, software, middleware and any other components to be employed.

Figure 4: Estonia's national health information system architecture



Source:© Estonian eHealth Foundation

Step Six: Design the procurement process

Design of the procurement process should start with reflection on how the procurement process can ensure the strategic aims of the initiative are met. Goals and as far as possible the steps required to reach them need to be clearly defined by this point. The expected outcomes should be described in sufficient detail as to allow evaluations to properly assess the project's success and progress to be meaningfully monitored (see step seven for further details on evaluation). Using these goals and outcomes, and relevant market analysis, the procurers can develop opinions on the most suitable process to adopt.

The need for relevant market analysis, means that the analysis undertaken in step one should be reviewed and if necessary expanded upon. This will provide procurers with a current overview of the products and providers available which will inform the decision of how best to approach the market and the most appropriate engagement strategy for achieving optimal outcomes. Standards for semantic and technical interoperability and their inclusion in the process are another factor that has to be considered in the market analysis.

Process owners should be fully established in this step, following on from their selection in step four. Allocation of their tasks and descriptions of their responsibilities should also be refined at this stage.

Requirements should be drawn up, premised on the investment brief in step four and defined by the analysis of design impacts in step five. The level of detail of requirements should be considered and is dependent on the tactics taken by procurers to manage their influence within the supply chain.

Possible approaches to managing the supply chain

- Highly detailed requirements would exert influence on the supply chain by directing the nature of responses, however this can be perceived as too limiting by vendors and could result in a lack of response if too restrictive. This kind of highly detailed response would be more practically applied to commissioners on a national level or at regional levels where there are elements of unison exist between regions.
- An alternative approach for exerting influence on the market would be through negotiation. This would mean that the level of detail for service design requirements is low as the focus is on outcome requirements i.e. the impact the service will have. This approach allows more freedom in response. The details could then be refined through an negotiation process whereby procurers assess bidders. Feedback on this assessment could also be used to exert influence. However, this is a time consuming task and resource intensive for bidders.
- Another approach is through the application of standards or unity between regions. If all procurements within a country followed standards set at the national level, this would make a clear case for vendor compliance in line with the procurer set standards. Arguably, it could also simplify the process.
- There are other means of managing the market not mentioned here but this list only serves to present some examples observed in the ProeHealth case studies and does not attempt to be exhaustive.

Finally, an analysis of legal requirements, such as how to deal with standards and competition laws, should be undertaken and means for ensuring compliance should be put in place. Measures for ensuring the appropriate level of transparency are important not only for legal reasons but also as a

means of communicating the probity of the process. If a process does not comply with legislation then it cannot proceed but controversy can have equally devastating effects for these projects which are susceptible to politics.

Step six: Carry out the procurement process

The procurement should be carried out according to the design developed in step five and in line with the general principles described in this guide:

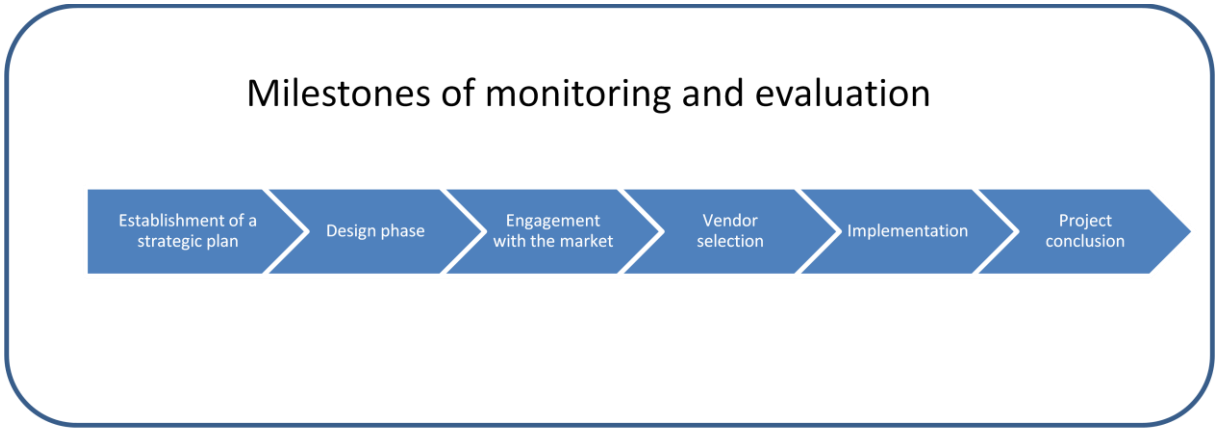
- led by a strong organisational team,
- in accordance with the schedule which should be maintained by the organisational team,
- with adherence to legislation and maintenance of transparency,
- using the adopted approach of supply chain management
- according to the requirements and evaluation methods specified
- with user and stakeholder representative involvement where appropriate
- with reference to the strategic aims and goals of the project.

Step Seven: Employ a monitoring and evaluation process

The monitoring and evaluation (M&E) step is actually an ongoing process and evaluation data should be collected at regular intervals throughout the procurement process. Examples of important milestones are:

- M&E at the establishment of a strategic plan
  - to ensure that appropriate goals and means to meet them are put in place
  - to oversee the drafting of a plan for later phases of M&E for monitoring progress and ensuring objectives are met
- M&E during the design phase
  - to ensure the design provides appropriate support for meeting planned objectives
- M&E during engagement with the market
  - to ensure competition rules and transparency are adhered to
- M&E during the selection of a vendor and product
  - to ensure the investment aims are met as fully as possible and regulation is abided by
- M&E during implementation and post implementation
  - again to ensure objectives are met.

Figure 5: Milestones of monitoring and evaluation for eHealth procurements



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The investment objectives also include a time plan which monitoring should report on so that planning can be appropriately altered should the schedule slip. The evaluations should aim to

measure and document the overall impact that the implementation progressively has on the relevant healthcare provision context.

Validation

The findings of the study, including the guidelines have been validated via an exchange with experts and key players at a dedicated validation workshop at the Invest Northern Ireland Offices, Brussels on 17th September 2012. The results of the workshop's discussion have helped to refine the guidelines.

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