WBL ARTIFICIAL INTELLIGENT MODELS FOR THE SEWAGE WATER SYSTEM IN THE PROVINCE LIMBURG, THE NETHERLANDS

Example of the use of Value Engineering clauses in a PCP linked to ongoing contracts for Process automation, Maintenance, Cybersecurity and Big Data

The Pre-Commercial Procurement (PCP) of Waterschapsbedrijf Limburg (WBL) aims to identify innovative AI models for maintenance prediction, efficiency improvement and costs reduction in the sewage water system. The innovative solutions should improve the management of the pipelines for the transportation of waste water, in order to anticipate problems and take proactive action for the correct functioning of these systems having more control over the operations. The Market Consultation results showed that there is still no technology available that combines IoT, Data Analytics, Artificial Intelligence and deep knowledge about the transportation of waste water and waste water treatment plants that meets the needs of WBL, which allows room for innovation.

Therefore, the PCP procurement of WBL is for R&D services to develop innovative solutions/algorithms to continuously analyse measured values and to convert these into intelligent signals that tell whether and what has changed in the system by using large amount of real time data obtained through different types of sensors in the field. The quality of the data must be monitored, and the structure of the data must be able to be changed easily and quickly, thus increasing the value of (Big) data for WBL. This will allow for more efficient planning of inspection and maintenance rounds and eventually lead to efficiency gains and cost reduction.

This PCP is linked, through Value Engineering clauses, to contracts resulting from another 3 lots procurement procedure: *"Procesautomatisering, Security and Big Data'*, with the purpose that R&D results of the PCP phases are implemented to improve the technologies and delivery of services related to: (1) Process Automation; (2) Security, and (3) Big Data. For example, lot 3 on Big Data solutions will be procured based on the results of phase 1 of the PCP, which will provide the functional specifications.

Both the PCP and the 3 lots procurement have set a condition of cooperation of suppliers to implement results adding value for WBL using value engineering methodologies. Value Engineering proposals by suppliers of Lot 1, 2 and 3 can integrate their own innovative solution(s) and/or the solution(s) developed during the PCP throughout the implementation of framework agreements.

Phase 1 aims to obtain:

(1) A solution design for lot 3, including the functional specifications that will be the input for the procurement of lot 3 on how to collect data, enrich data, store data on premise or in the cloud, analyse data and convert data into information with a set of standard tools to optimise water management.
(2) A solution design for common situation, including the prototype for the transport system Venray in detail, and the roll out the full transport system of WBL. The design should be useable for the full transport system in the province Limburg in The Netherlands. That means the existing of 149 WBL pumping stations.
(3) A solution design for the future including how to integrate thousands of small pumping stations of municipalities, and the possibilities to integrate administrative data from administrative systems in the future.

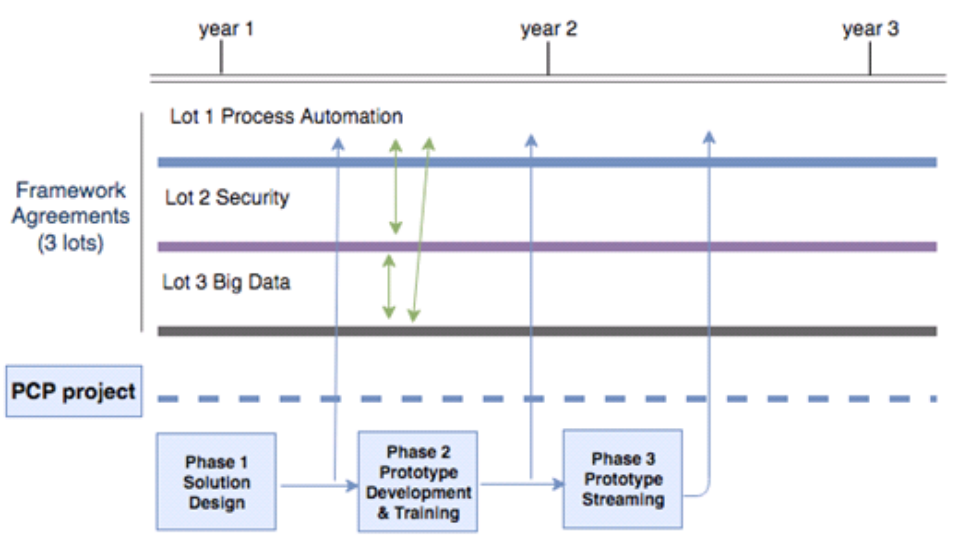

Figure 1. The PCP project in relation to the contracts for process automation, security and Big Data.

a) Cooperation of suppliers to implement results adding value for WBL using value engineering methodologies.

b) Value Engineering proposals by suppliers of Lot 1, 2 and 3 can integrate their own innovative solution(s) and/or the solution(s) developed during the Big Data PCP throughout the implementation of the framework agreements.

Phase 2 aims to a Prototype Development and Training which includes:

(1) Developing the machine learning model and train it with existing historical data.

(2) The size of the prototype is the transport system (pumping stations combined with gravity / freefall) of the sewage plant Venray.

Phase 3 aims to prototype Streaming to test the developed model on streaming data. The system should: optimise the transport system / sewer plant and trigger the asset management system for maintenance.

During Phases 2 and 3 of the PCP, the competing suppliers are required to collaborate with those suppliers related to Lot 1 and Lot 2.

Framework Agreements have been awarded to 5 suppliers. Phase 2 contracts have been awarded to 3 suppliers. Phase 3 contracts have been awarded to 2 suppliers. The end of the PCP is planned for September 2021.

Source: WBL PCP procurement
https://ted.europa.eu/udl?uri=TED:NOTICE:575861-2019:TEXT:EN:HTML&src=0
https://www.tenderned.nl/tenderned-tap/aankondigingen/181906;section=0