

DECIdE – Multi-Criteria DECision Support Platform for Urban Water InfrastructurEs

Summary

The aim of the proposed DECIdE project is the development of a new information technology (IT) platform, specially tailored for infrastructure asset management (IAM) of urban water systems operated by water utilities of low digital maturity level. This platform integrates data from different information systems (IS) and includes tools to support decision-making in terms of water losses, energy efficiency and quality of service.

The DECIdE project is composed of three main activities: 1) Characterization of the information systems; 2) Platform development; 3) Report elaboration.

The first activity involves the characterization and survey of the existing IS of the water utilities project partners. The second activity consists of development of the IT open-source platform, integrating different data from the water utilities with several information systems and the development of relevant assessment tools. Finally, the third activity consists of the preparation of reports such as user's guide and best practices guidelines for efficient information management. These reports aim to support water utilities in planning, acquiring, organizing and maintaining long-term effective and efficient information.

Several water utilities have been closely involved in the development of the three activities, since they will be the end-users of the platform.

This platform has been tested with data from five small to medium size Portuguese water utilities with different maturity levels in terms of

technological and human resources. Obtained results are very promising since the platform allows to assess the systems performance periodically which constitute an important part of the infrastructure asset management for small and medium-sized water utilities.

Figure 1 shows the graphical user interface (GUI) for the data import module. Figure 2 presents an example of bar representations with the distribution of pipes in the analysed water distribution system classified, using a three-colour scale, in good (green), average (yellow) or unsatisfactory (red) in each performance indicator. Figure 3 depicts the water balance calculation and the respective performance indicators.

The DECIdE platform represents the first step towards the development of a national reference tool to assist small and medium-sized water utilities to implement IAM processes. The platform will be further developed to include additional tools, namely: a flowrate and pressure time series data processing and analysis module, hydraulic simulation capabilities to carry more advanced performance assessment techniques, and IVI calculation. Additionally, the data model is expected to change to a different technology aiming to accommodate modules for more advanced techniques, such as pattern recognition, demand forecasting, and leak detection. The rationale behind the platform's development can be further extended to different fields in engineering where IAM is required, such as wastewater and stormwater, transportation, and oil and gas.



Project Reference

SAICT-POL/24135/2016

Leading Institution

IPS – Instituto Politécnico de Setúbal (Portugal)

Partners

IST – Instituto Superior Técnico (Portugal), IPB – Instituto Politécnico de Beja (Portugal), Município do Barreiro (Portugal), Município de Reguengos de Monsaraz (Portugal), Município de Palmela (Portugal), Município de Montemor-o-Novo (Portugal), Infraqinta (Portugal)

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Funding

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Period

2018-2020

Total

1 49 623.00€

CERIS

28 812.00€

Project Website

decide.ips.pt

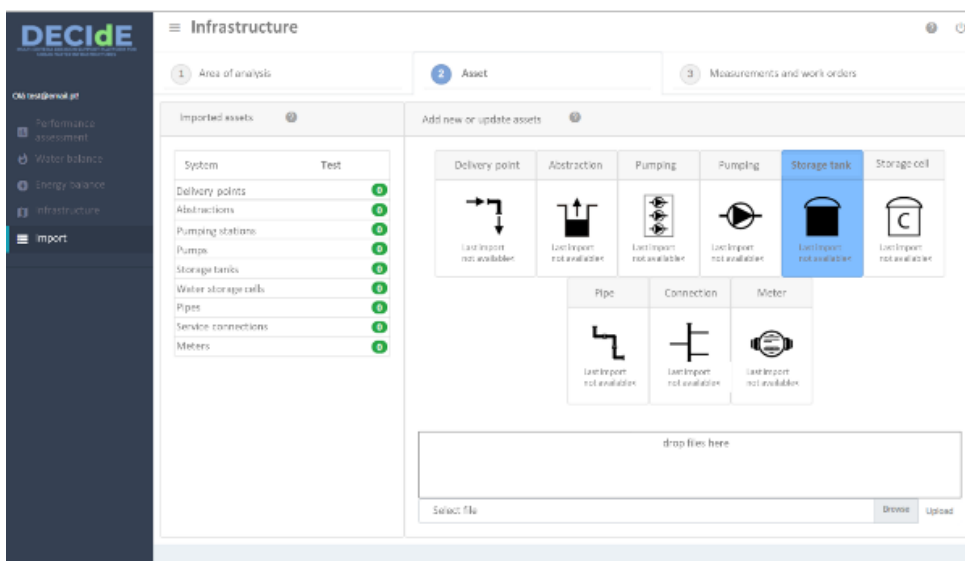


Figure 1. Graphical User Interface of the data import module (adapted from the Portuguese version).

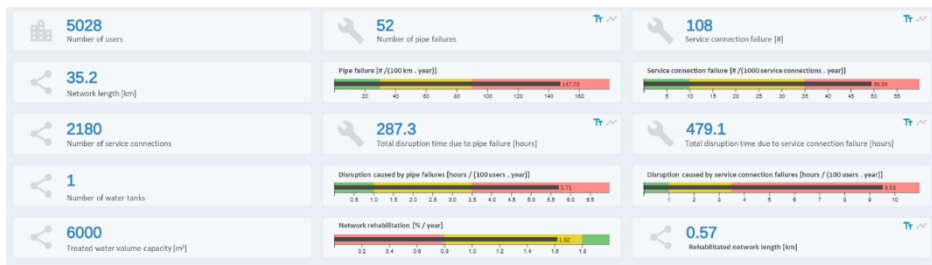


Figure 2. Summary of the performance indicators for a water distribution network (adapted from the Portuguese version).

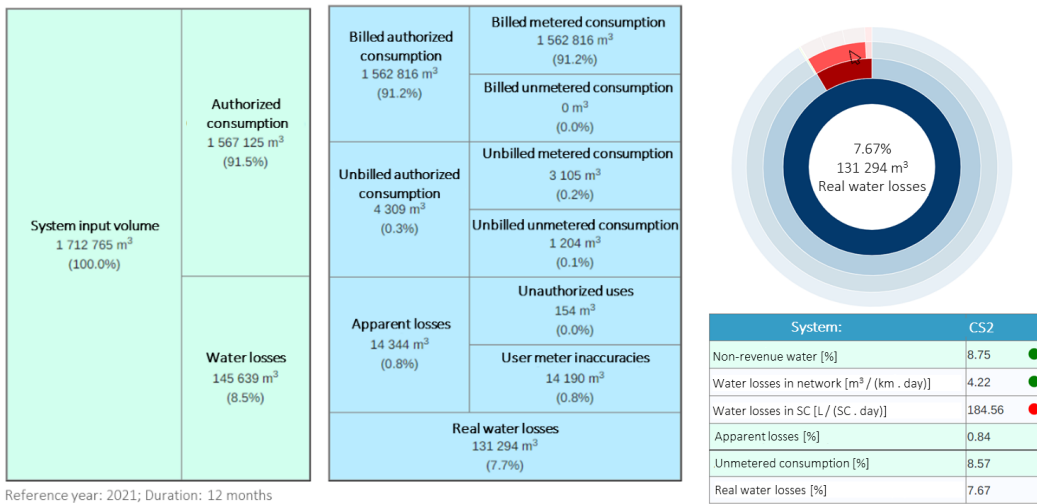


Figure 3. Water balance (on the left) and the water losses performance indicators (on the right) (Adapted from the Portuguese version).