Establishing a new performance assessment system for the Croatian water and sewerage services

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PI2017 Conference, Vienna
Establishing a new performance assessment system for the Croatian water and sewerage services

1. Introduction
2. Setting a Performance assessment system
3. Data analysis
4. Conclusions
Introduction

Croatian water service context

Mediterranean country

Continuous water supply

Universal metering

Average water drinking quality: 95%

In general terms:
Good quality of service
Introduction

Croatian context

Still room for improvement

Croatia is a EU member → European Water Framework Directive (2000/60/EC)

(2013)

Most critical areas:

– Total costs recovery
– Wastewater discharge (28% of wastewater treated)
– Non-revenue water (14m3/km/day)
Introduction

Motivation of the project

Know the Croatian water sector
- Efficiencies to be gained for each utility
- Weaknesses

Results of the assessment will be used for
- Decision making process to improve the sector performance and meet the European Water Framework Directive goals
- Driving the sector to an excellent performance
Introduction
Setting a performance assessment system

What are we going to measure?

The performance assessment system will consider:

- Water supply service
- Wastewater service (Sewerage and WWTP)

All Croatian utilities: 164

- 113 utilities provide both services
- 29 utilities provide only water supply
- 22 utilities provide only wastewater services
Setting a performance assessment system

Structured approach

ISO 24500 standards /IWA approach for PIs
  — Alignment between the objectives of the assessment and performance indicators (PIs)

Total number of PIs
  — Enough to get all the information
  — Concise set
  — Address all the objectives

Workshops and take into account all stakeholders
Setting a performance assessment system

From objectives to Performance Indicators (PIs)

Objectives → Be addressed by at least 1 PI
- Affordability
- Non-revenue water reduction
- Flooding reduction
- Quality of water and wastewater
- Adequate number of staff
- Water interruptions / blockages reduction

The final PI set: → Be related to one objective
- 36 indicators
- 128 variables
- 24 context information data

<table>
<thead>
<tr>
<th></th>
<th>WS PIs</th>
<th>WWS PIs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Both</td>
<td>12</td>
<td></td>
</tr>
</tbody>
</table>

Coincidence?

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Setting a performance assessment system

Data quality: A simplified approach

Quantitative approach is always difficult to implement

New approach: Qualitative data quality system: Successful examples: ERSAR, AquaRating...

<table>
<thead>
<tr>
<th>A03 - System input volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value estimated from all metered inputs into the system, meters have not been calibrated or certified after their installation, used for billing purposes</td>
</tr>
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</table>

Accuracy
Reliability
Setting a performance assessment system

Software: Sigma

Official software of the IWA PI System

Advantages:
– No need for utilities to install any software (Sigma WebServer)
– Easy visualization and analysis of data
– Powerful graphic analysis
Setting a performance assessment system

Pilot utility

1. Find any possible errors in the system
2. Show the remaining utilities the methodology of data collection

Middle size utility serving WS and WW

Results:

- Modification of PIs definition
- Modification of variables definition
Data analysis

Data collection analysis: Results

<table>
<thead>
<tr>
<th>result for all WS/WW utilities:</th>
<th>90 to 100%</th>
<th>75 to 90%</th>
<th>50 to 75%</th>
<th>25 to 50%</th>
<th>1 to 25%</th>
<th>&lt; 1%</th>
</tr>
</thead>
<tbody>
<tr>
<td>46%</td>
<td>4%</td>
<td>7%</td>
<td>1%</td>
<td>20%</td>
<td>23%</td>
<td></td>
</tr>
</tbody>
</table>

30 utilities out of 164 with no data (18%) → small utilities (No data collection implemented)

Local support is crucial
Data analysis

Preliminary analysis: Outlier detection

Possible outliers

Analyse each case individually. Is it correct or an error?
Data analysis

Clustering utilities

Multiple factors impact on the utilities performance (population density, topography...)

Clustering is basic for:
  — Grouping utilities into homogeneous groups
  — Sound data analysis and interpretation of results
Data analysis

Clustering utilities: Are clusters adequate?
Clustering utilities

Clusters for Croatian utilities

After a workshop and data analysis the following clusters emerged:

Tourist rate
- Areas with more than 30% of tourist rate
- Areas with less than 30% of tourist rate

Size by water provided (billed authorized consumption)
- Big
- Medium big
- Medium small
- Small

WWTP facility (Only applied to utilities providing wastewater services)
- Utilities with WWTP
- Utilities without WWTP
Reports

Presenting results

1. Annual reports reflecting the sector performance
2. Exchange of best practices: round tables
3. Individual annual reports for utilities
Conclusions

1. Alignment between objectives and PIs

2. Keep the PI set as concise and compact as possible

3. Interaction between stakeholders: Workshops!

4. Data analysis basic for the validity of decisions to be made

5. Outlier detection the first and necessary step

6. Clustering utilities necessary for a sound data analysis

7. Annual reports and exchange of best practices
Thank you for your attention
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