Setting Up Municipal Local Action Plans for Waste Management Involving the Use of ICT Tools

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Waste Management Planning

- Basic element in public planning in EU Member States
  - Meet requirements of EU directives
  - Achieve EU recycling targets

2020: 50% MSW  
2030: 65% MSW
Municipalities need to deal with:
- Overfilled bins
- Traffic & noise (waste collection vehicles)
- Luck of infrastructure
- Capital & Operational Costs
Optimistic recycling targets
“The 4th Industrial Revolution”
- Innovation
- ICT tools
  - Digital technology
  - Mobile apps
  - Sensing technology
  - Artificial intelligence
- Robotics

We look for New Waste Management Models
The EU is intensively implementing policies and programs that support innovation.

- Increase investment in research and development
- Convert research into improved goods, services or process for the market

Innovation in waste management is a part of the EU philosophy.

Modern need for ICT compatibility and use within the cities
ICT tools - Web and Mobile Applications & Waste Management

- Optimizing waste collection
- Improve recycling
- Raise citizen’s awareness
- Promote e-democracy
- Enhance citizen’s participation in waste prevention and recycling programs
The LIFE EWAS project

Life EWAS: General Information

- Start date: 1st July 2014
- End date: 31st March 2017
- 7 Partners Involved
- 2 Countries Greece & Spain
- Budget: 1.168.561 €

Efficient and sustainable waste management methodologies using ICT tools enabling GHG emissions reduction

Partners involved:
- Wellness Telecom
- ΔΕΔΙΣΑ
- Wellness Cities & Solutions
- LIPASAM
- Empresas Municipales Corporación
- NOSSO Ayuntamiento de Sevilla
- D-WASTE™
Life EWAS: Main Objectives

WASTE MANAGEMENT SOLUTION BASED ON REAL-TIME DATA

Introduce an **intelligent waste collection system**, that by **sensing** and constantly **monitoring** of the filling **level of the containers** optimizes **routes**, and **improves the costs** associated with the collection service.

- Avoid overfilling
- Reduce operational costs
- CO2 emissions reduction
- Improve quality of service

- Monitoring device **installed inside the containers**
- Gathers data in real-time
- No other hardware required
The Pilots

268 bins (glass)
Routes: 3 - 120 km

Sevilla
693,000 Inhabitants

355 bins (glass and blue bin Paper Plastic & Metal)
Routes: 5 - 150 km

Chania
300,000 Inhabitants
How does it work?

Volumetric container measurement sensor
Software/Platform

Redesign of Routes
Life EWAS: Starting point, 3 fixed routes / 12 days

Container 35-45% Filled
Life EWAS: Current Location ->1 Dynamic Route EWAS / 7 days

Average Fill 90%
## Life EWAS: Current Results

<table>
<thead>
<tr>
<th></th>
<th>Data prior to deployment</th>
<th>Current Data (34 services)</th>
<th>Reduction</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>No. Routes</strong></td>
<td>3</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td><strong>No. Annual Collection</strong></td>
<td>100</td>
<td>34</td>
<td>66%</td>
</tr>
<tr>
<td><strong>Service Round</strong></td>
<td>700</td>
<td>255</td>
<td></td>
</tr>
</tbody>
</table>

### Cost (PM, Maintenance, Management)

<table>
<thead>
<tr>
<th></th>
<th>Service Unit</th>
<th>Data prior to deployment (100 services)</th>
<th>Current Data (34 services)</th>
<th>Savings</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cost (PM, Maintenance, Management)</strong></td>
<td>460€</td>
<td>46.070€</td>
<td>15.642€</td>
<td>30.364€</td>
</tr>
<tr>
<td><strong>Km Distance</strong></td>
<td>107 km</td>
<td>10.700 km</td>
<td>3.638 km</td>
<td>7.062 km</td>
</tr>
<tr>
<td><strong>Consumption (litres)</strong></td>
<td>56 l</td>
<td>5.600 l</td>
<td>1.904 l</td>
<td>3.696 l</td>
</tr>
</tbody>
</table>

- Reduction of costs: 60%
- 9.700 Kg CO2
Social Platform

Innovative & executive tools
Integrated use of new communication channels

Social Platform

socialplatform.life-ewas.eu
Learn how to Recycle with EWAS

Citizens' participation
Social media, interactive communication
- General Facts with images and short texts on the importance of recycling
- A list of waste to learn how to recycle them
- Tailored made tips for the improvement of recycling at home
- General Information about waste and their processing
Something To Inform?

Select a container

Submit an issue

- Ability to report the status of the bin:
  - Empty bin,
  - half-full bin,
  - full bin,
  - fire in the bin
  - broken bin
  - fallen bin
  - misplaced bin
  - waste out of the bin
  - other

Other comments:

Send
Life EWAS: Challenges

Challenge to install sensors at bins with open lids. At the case of Chania the sensors in order to measure filling levels had to be installed at the side of the bin and not on the lid.

Weak or no available GPRS signal. Areas with weak or no GPRS signal might not provide sufficient data to the waste managers on the real filling levels of the monitored bin.

Remove/Steal or Damage the sensors. There is a possibility that the sensors could be stolen or damaged.

Battery running out quick. Although the battery of each sensor has a guaranty of 2 years there might be cases of batteries that will run out in less than 2 years.

Weakness to access the waste managers’ platform. Due to technical problems there is a possibility that the waste manager’s platform would not be accessible at all times.
CONCLUSIONS

Benefits

- Improve waste management (costs, services provided, efficiency etc)
- Raise citizens awareness on recycling
- Brings citizens closer to the decision-making center.
- Engage citizens in waste management
- Provides real-time data for waste managers

Municipalities

- The municipality is aware of citizen’s opinion in real-time.

Utilities / Waste managers

Citizens

PROACTIVE SYSTEMS
THANKS FOR YOUR ATTENTION

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