New Task
Big Data for Energy Efficiency

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Leonardo ENERGY
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Big Data for Energy Efficiency

- Use of **data analytic methods** and approaches to identify **energy efficiency potentials** in consumption and other areas of energy usage.
Use Cases

- Power Systems
  - Power System Network data from sensors and meters (e.g. smart meters) to identify losses and other inefficient network conditions.

- High losses (“non-technical”)

- Renewables impact
Use Cases

• Consumer devices
  • Consumption of electronic devices: use meter data and data discovery to identify the energy consumption of gadgets.
Use Cases

- Consumer behavior and segmentation
- Identification of energy intensive user behavior (segmentation, etc.), using demographic data for more detailed information.

<table>
<thead>
<tr>
<th>Socio-demographic variables</th>
<th>Description</th>
<th>Number of categories</th>
<th>Example(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>GSP group</td>
<td>Grid Supply Point Group in UK, which are regional electricity distribution networks</td>
<td>Total 14</td>
<td>Southern; South Wales; North Scotland</td>
</tr>
<tr>
<td>Age</td>
<td>Age of head of household</td>
<td>6</td>
<td>Age 26-35</td>
</tr>
<tr>
<td>Decision Maker Type</td>
<td>Type of person deciding household matters</td>
<td>13</td>
<td>Young Couple</td>
</tr>
<tr>
<td>Family Lifestage</td>
<td>The combined stage of life and family status including children</td>
<td>14</td>
<td>Young family with children</td>
</tr>
<tr>
<td>Household Composition</td>
<td>People living together and their relationships to one another</td>
<td>13</td>
<td>Male homeowners</td>
</tr>
<tr>
<td>Household Income Band</td>
<td>Total household income per year</td>
<td>10</td>
<td>£30,000 to £39,999</td>
</tr>
<tr>
<td>Mains gas flag</td>
<td>Whether a household is connected to the Mains gas network; if Yes, it's assumed that the household uses gas</td>
<td>2</td>
<td>Connected to gas; not connected to gas</td>
</tr>
<tr>
<td>Mosaic Public Sector Group</td>
<td>Classification on citizen's location, demographics, lifestyles and behaviors</td>
<td>15</td>
<td>Young, well-educated city dwellers; Wealthy people living in the most sought after neighborhoods</td>
</tr>
<tr>
<td>Mosaic Public Sector Type</td>
<td>Subcategories of Mosaic Public Sector Group</td>
<td>69</td>
<td>Young professional families settling in better quality older terraces</td>
</tr>
<tr>
<td>Number of Bedrooms</td>
<td>Number of Bedrooms of the property</td>
<td>5</td>
<td>5+ bedrooms</td>
</tr>
<tr>
<td>Property Age</td>
<td>When the property was built</td>
<td>6</td>
<td>1911-1919</td>
</tr>
<tr>
<td>Property Type 2011</td>
<td>Type of property in 2011</td>
<td>5</td>
<td>Purpose built flats; Farm</td>
</tr>
<tr>
<td>Property Value Fine</td>
<td>Estimated property value</td>
<td>25</td>
<td>£500,001 to £600,000</td>
</tr>
<tr>
<td>Tenure 2011</td>
<td>Property ownership in 2011</td>
<td>3</td>
<td>Privately rented</td>
</tr>
</tbody>
</table>
Use Cases

• Energy Efficiency in Industry - Industry 4.0
  • Predictive Maintenance and Quality
  • Field Asset Monitoring

The Value of PMQ

1. Lowering Unit/Item Cost (Improving profit/margin)
2. Increasing Production “Yield” (Productivity)
3. Superior ROA and “Asset Optimization”
4. Higher Revenue due to Quality Improvement
5. Increased Competitiveness due to higher Quality
6. New Services for Health Monitoring of Assets
7. Lower Risks due to fewer or elimination of Asset Failures

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