Smartline: A new vision for health and housing

Wednesday 16 November, St Austell Conference Centre & Online
Improving homes and health with sensor systems

Are they acceptable?
Are they effective?

Dr Tim Walker
TEST PROPERTY

TEMPERATURE

Front Room

<table>
<thead>
<tr>
<th></th>
<th>Last reading</th>
<th>Yesterday</th>
<th>This week</th>
<th>This month</th>
<th>This year</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>21.2 °C</td>
<td>21.5 °C</td>
<td>21.5 °C</td>
<td>21.6 °C</td>
<td>21.9 °C</td>
</tr>
<tr>
<td>Current status:</td>
<td>Comfort Zone</td>
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<td>This is in the ideal</td>
<td>temperature range.</td>
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Bedroom

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<td>22.0 °C</td>
<td>22.3 °C</td>
<td>22.1 °C</td>
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Occupant Dashboard (intuitive):

- Traffic light colour-coding to communicate risk;
- Explanations;
- Tips and advice;
- Timescales for plots.
Coastline Dashboard (risk focused):

- ‘birds-eye’ view of all properties;
- Colour coded;
- Sortable;
- Detailed views.
Value and Challenges of Co-design

Value:
• Practical wisdom on what is sensible to pursue, rather than technologically possible;
• Increase system usefulness though tailoring to user needs;
• Fun.

Challenges:
• Recruiting a diverse user testing group;
• Requires a team with diverse skills;
• Implementation of all the new ideas.
Research Questions

Was the system acceptable?

Was the system used?

Was the system useful?
Acceptability

**Attitudes:**
- Ability of sensors to reveal behaviours and lifestyle choices;
  = Fear of privacy intrusion and data misuse.

**Other acceptability factors:**
- Perceived usefulness;
- Technical support;
- Ease of use;
- Cost.
Was the system acceptable?

Positive attitudes:
• General concern for privacy and data use;
• Trusting relationship with Coastline;
• Coastline perceived as having credible intentions for data use.

“Welcome to share my data with Coastline, I have been a long standing tenant and they have been good to me”
(Martha, 62)

Perceived as useful:
• Improve design and management of future social housing;
• Although, no health related expectations.

“Looking after you, not at you”
Project tag line
Was the system used?

**Occupant Use:**
- High intention to use initially;
- Low long term actual use;
- Few changes to how occupants manage their home occurred as result of using dashboard.

**Coastline Use:**
- Regular and successful use;
- Identifying high risk homes and intervening;
- System most useful in the winter.
<table>
<thead>
<tr>
<th>Occupant</th>
<th>What did the sensor dashboard indicate?</th>
<th>Issues identified on home visit</th>
<th>What action was taken?</th>
</tr>
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<td><strong>Example 1.</strong> Family</td>
<td>High humidity (65-80%) downstairs.</td>
<td>Humid property with mould; Large fish tank in the living room, open vivarium in the hallway.</td>
<td>Advice and guidance on ventilation; Replaced fans; Installed Positive Input Ventilation (PIV) system.</td>
</tr>
<tr>
<td><strong>Example 2.</strong> Family</td>
<td>Drop in temperature.</td>
<td>Fuel poverty; Caused by a change in circumstances leading to loss of income and benefits.</td>
<td>Emergency Hardship Fund (Coastline); Covid Winter Grant (Council), heated throw and energy vouchers; Support from a local energy charity: • top up vouchers; • Change in energy supplier; • Warm Home Discount payment. EPC rated high, but Coastline surveyor found loft installation removed (by previous occupant). Cause of high costs</td>
</tr>
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Is the system useful for improving health?

• Identify and prioritise at risk and vulnerable occupants;

• Enable early intervention to support occupant health and wellbeing;

• Reduce stress among Coastline staff;

However, some risks and limitations:
• Responsibility to act;
• Resources and capacity to act.
Is the system useful for improving homes?

- Clearly and pro-actively identify building maintenance issues;
- Reduce long term costs through proactive repairs and efficient planning of maintenance work;
- Insight to inform Carbon Net Zero strategy, and live data to evaluate progress.
Conclusions

• System useful for identifying risk, but need to be matched with human capacity for intervention and social support;

• Housing Associations are uniquely placed as intermediaries to improve health and wellbeing among populations which face social and health inequities;

• Research and innovation not possible without community participation and co-design.

“What you might at first see as a technical problem is actually a social problem”

Coastline Support Team member