Programme Area: Buildings

Project: Building Supply Chain for Mass Refurbishment of Houses

Title: Appendix 5 – Workshop Presentation 9th June 2011

Abstract:

Please note this report was produced in 2011/2012 and its contents may be out of date. This document is an appendix of Deliverable 4.2 – Draft Supply Chain Scenarios.

Context:

This project looked at designing a supply chain solution to improve the energy efficiency of the vast majority of the 26 million UK homes which will still be in use by 2050.It looked to identify ways in which the refurbishment and retrofitting of existing residential properties can be accelerated by industrialising the processes of design, supply and implementation, while stimulating demand from householders by exploiting additional opportunities that come with extensive building refurbishment.The project developed a top-to-bottom process, using a method of analysing the most cost-effective package of measures suitable for a particular property, through to how these will be installed with the minimum disruption to the householder. This includes identifying the skills required of the people on the ground as well as the optimum material distribution networks to supply them with exactly what is required and when.

The Energy Zone Consortium

Whole House Retrofit For Thermal Efficiency.

"The Survey"

Paul Cook 9th June 2011

Total Flow Ltd.

Summary of WP 4.0 and 4.1

Work Package 4.0 delivered a summary of the existing supply chain

Work Package 4.1 delivered :

- Draft Value propositions for 10 customer segments
- Draft “Ideal state” supply chain design to deliver the needs of mass scale whole house retrofit.
- Gaps between the ideal and current state supply chains
- Contrasts with France and Germany
- Lessons from previous national roll out programmes

WP 4.1 Highlights

Key ingredients to a successful value proposition

- Trusted brand / delivery / support is essential – Single provider
- Disruption must be minimised – one team for installation
- Evaluating potential for energy savings - visible / measurable benefits
- linking retrofit to other value adding works in the home (ie. Loft conversion)
- Providing information to customer and the supply chain
- Providing robust standard work for retrofit works - no surprises

WP 4.2 Process - Workshop

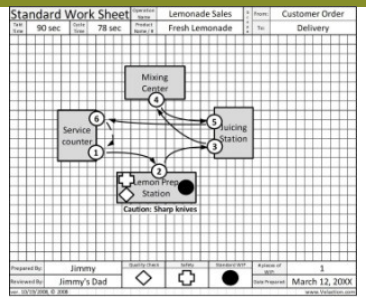
The Survey

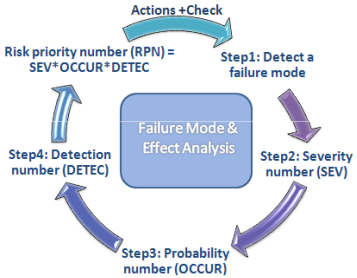
Target time for survey is 4 Hours

Based on our knowledge of whole house refurbishment :-

- What outputs or outcomes are required form the survey?
- How will the outputs be obtained?
- How will the outputs be used? (Quote / benefits to customer, info to supply chain…)
- What can go wrong at each point - what are the “failure modes”?
- What can we do to improve the likelihood of success?

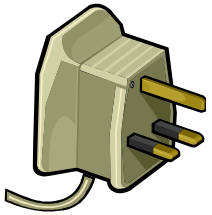
WP4.2 – Process For Today





Working through the retrofit process

- Specify required outputs / outcomes
- Define processes required to achieve outcomes
- Define the failure modes
- Apply “Mistake Proofing” principles (Poka yoke)



- What innovation and invention is needed to make whole house retrofit attractive and viable?

WP 4.2 Process - Workshop

Scope of measures

Intervention Scope	Measures
Primary	Primary heat source (boilers, heat pumps) Wall, floor, loft, roof insulation Windows and doors
Secondary	MVHR ventilation systems Solar Thermal systems Energy management systems Electric showers
Tertiary	Decoration products Trade supplies Low energy lighting

Syndicate Group Focus

- Householder and Site Focus (Seb Junemann)

  Includes heating controls and boiler

- Roof and Extensions (David Lake)

- Floors and External Walls (Warren Pope)

- Windows & Doors and Walls Internal (Tim Hall)

  Includes Radiators

Workshop Step 1 Outputs and Methods

Using the pre-printed tickets:

1. List the Outputs required from the survey. These may be dimensions, information, energy rating, proposal to customer, information to supply chain…….
2. List the method used to obtain the output. Methods may include measurement, visual assessment, drill hole and use borescope…..
3. Do not get bogged down at any stage, if you are unsure move on.
4. Look for opportunities for innovation - these are areas where technology or new methods are needed. (To see through walls, look under floorboards, test wall tie integrity)

Workshop Process Step 1

Method: completing pre printed tickets

Group	Doors and Windows	Item Number	6	More
Required Output: Accurate Measurement of Doors and Windows (10 windows 2 doors) Sizes, squareness, sills, reveals.				
Method Tapemeasure and square		H	Crit	Imp	Add
May use photograph & yardstick			H	M	L
Estimate 2 mins per window 5mins for door		Dis			✓
		Time		✓	
Transpose digits, misread, miss out of square		Risk		✓	
Improvement		£			✓
		Severe	Freq.	Detect	RPN

Complete tickets for your teams first topic / area of focus.

Workshop Step 1 Topic 2

Complete tickets for your second topic / area of focus

Workshop Step 2 - FMEA

Failure Mode and effect analysis (FMEA) is a tool that has been widely used in manufacturing It is a 5 step process.

Step 1. Define required outputs / functions **– Done in workshop step 1**

Step 2. List failure modes, how failures occur and their severity

Step 3. Evaluate the frequency of the failure modes

Step 4. Evaluate the detectability of the failure before it reaches the customer

Step 5. Calculate the Risk Priority Number (RPN) to prioritise improvement action and develop processes to mitigate process weaknesses.

Evaluate / Score each ticket for Severity, Frequency and Detectability then calculate the RPN

Workshop Step 2 - FMEA

Method: Completing the pre printed tickets

Group	Doors and Windows	Item Number	6	Yes
Required Output	Accurate Measurement of Doors and Windows (10 windows 2 doors) Sizes, squareness, sills, reveals.			
Method	Tapemeasure and square	H	Crit	Imp	Add
May use photograph & yardstick			H	M	L
Estimate 2 mins per window 5mins for door		Dis			✓
		Time		✓	
Transpose digits, misread, miss out of square		Risk		✓	
Improvement		£			✓
Laser scan direct to tablet with dimensions		Severe	Freq.	Detect	RPN
Full 3D BIM data file with direct factory link		6	2	7	84

Workshop Step 3 – Priorities for improvement

To invent new solutions follow these steps:

- State why the problem exists?
- State the contradiction?
- Imagine you have no constraints, imagine the solution.

Example. Assessing floor joist condition

The problem exists because carpet and floor boards need to be removed to look at joists

The Contradiction is - it takes too long to remove carpet and floorboards to allow a visual inspection.

I can imagine several solutions from microscopic cameras, to making a hole in the external wall and using an endoscope.

Workshop Step 3 – Priorities for improvement

Improvement Strategies.

- Eliminate the need for the work / process step
- Combine process steps or use output form a previous / future step
- Simplify the process / automate data collection

Step 4 - Arrange Your Workshop Outputs

Please arrange the work of your group into High/medium/low criticality:

The outputs form this workshop will be used as the foundation for standard work and act as a “Pull” for enabling technologies-

- Products
- Process
- Tools
- Competence

Workshop Review

Challenges:

Can the survey be carried out in 4 hours?

What would need to change to make this possisble?

Review

- Review of the day and Comments.

Thank You