

# Feedback in the building process: meeting occupants' needs from start to finish

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# UK intentions... for all housing

Greenwatt Way  
PRP architects

Research focussing on  
behaviour and performance

**Functional usability** is often  
overlooked, but it is **upstream**  
of the above



# The gap between design and reality

increasing emphasis on user behaviour  
to explain the gap between intention  
and reality.

**But...**

the window design was at fault here.

**Danger of blaming the user...not the  
design.**



# Key user control needs

Touchpoints = **everything** in the home that the **user physically touches** in order to provide environmental and comfort control

**7** Categories:

- 1. Heating**
- 2. Mechanical ventilation**
- 3. Electrical equipment**
- 4. Kitchen appliances**
- 5. External fabric**
- 6. Water services**
- 7. Other**

# Design for user understanding

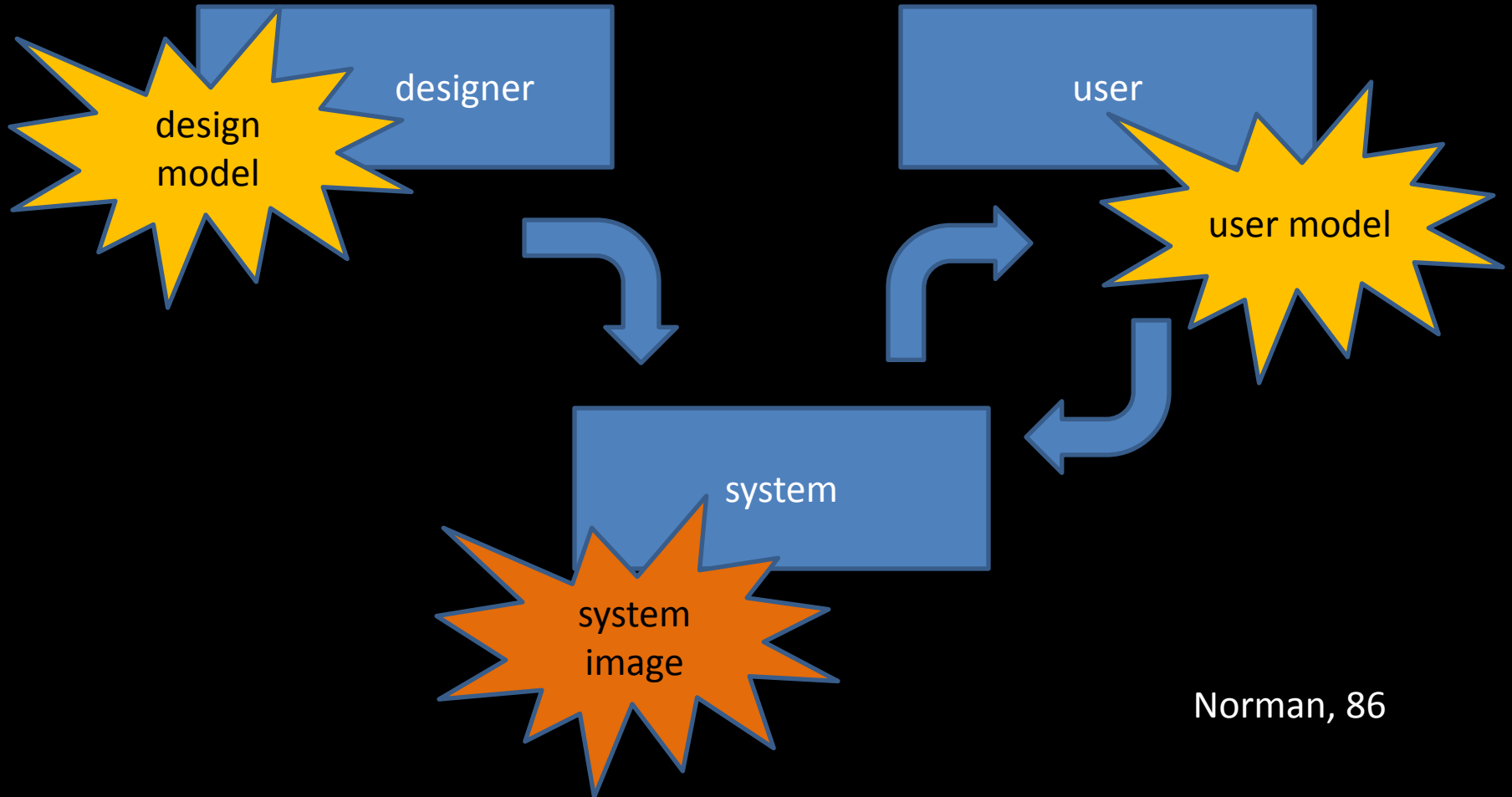
communicating a **clear design intent** is critical to user's understanding of the meaning and function of building features and systems

Leaman and Bordass

industrial designers have been doing it for years... why not in housing?



# Conceptual congruency in design



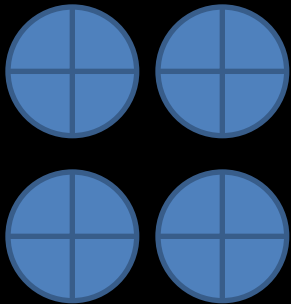
Norman, 86

# Mapping for usable design

**Mapping** = relationship between two things e.g. controls and results in world

**Natural mapping** = immediate understanding from culture, biology, perception

**Mapping problems** = cognitive dissonance ('does not compute, not logical counterintuitive..') – no direct spatial relationship



# Things that go wrong with usability

too many features =

**too much information =**  
**user alienation**

smaller and faster is not always  
better

**over automation –**  
can be just as bad

**Users blame themselves**  
or wrong cause





# Usability at **briefing stage**– the 6 criteria

1. Clarity of purpose
2. Intuitive design
3. Labelling
4. Ease of use
5. Feedback
6. Degree of fine control



Bordass, Leaman and Bunn

# Better briefing procedures

**feasibility stage** – consider the aims of the project in terms of:

- **specified users** who use a product (the building) to achieve specified goals
- **context** - relationship between building and users
- efficiency, value creation and user satisfaction that contribute to achieving the **specified goals**

**briefing stage** - ensure each aspect is addressed in brief to design team – **in detail**

**Location issues... design co-ordination stage**



# Better design stage procedures

consider the design of the project in terms of:

- **service/structure/fabric co-ordination** strategy to be confirmed at outset
- use **design charettes** with all stakeholders
- service drawings to be co-ordinated with design drawings through **BIM**
- **detailed specification** for services to be confirmed at an early stage

# Usability issues - specification stage

## Small development

- MEV extract terminals
- MEV control panel
- woodstove boiler fuel
- hot and heating system controls



## Large development

- MVHR controls
- Boiler unit controls
- Television socket
- Roof Lantern switch




# Better specification stage procedures

consider in terms of:

- standard specifications for organisation – have these been checked for **usability compliance with ISO standards?**
- new products – has manufacturer carried out **usability tests in situ?**
- are products fit for purpose for **Lifetime Homes?**

# Issues at commissioning stage



“Not sure what I’m doing here...”

“I’ll leave the guidance manual here....”

# Better commissioning stage procedures

consider in terms of:

- ensure all requirements are fully identified in **tender documentation**
- insist on **robust testing** - e.g. airtightness x 3 (first fix, handover, POE)
- **competency requirements** for all installers



# Hand over stage

Home Demonstrators thought MVHR would “balance” the heat of the house

**No hands on experience** of heating or ventilation controls.

Occupants appeared content but did not understand key points



# Better handover procedures

tender action – build in the requirements for usability and guidance

train staff to fully explain technology – or partner up with installers

people can only absorb **7** pieces of information at any one time

**allow more time for handover to occupant and repeat procedures later on**

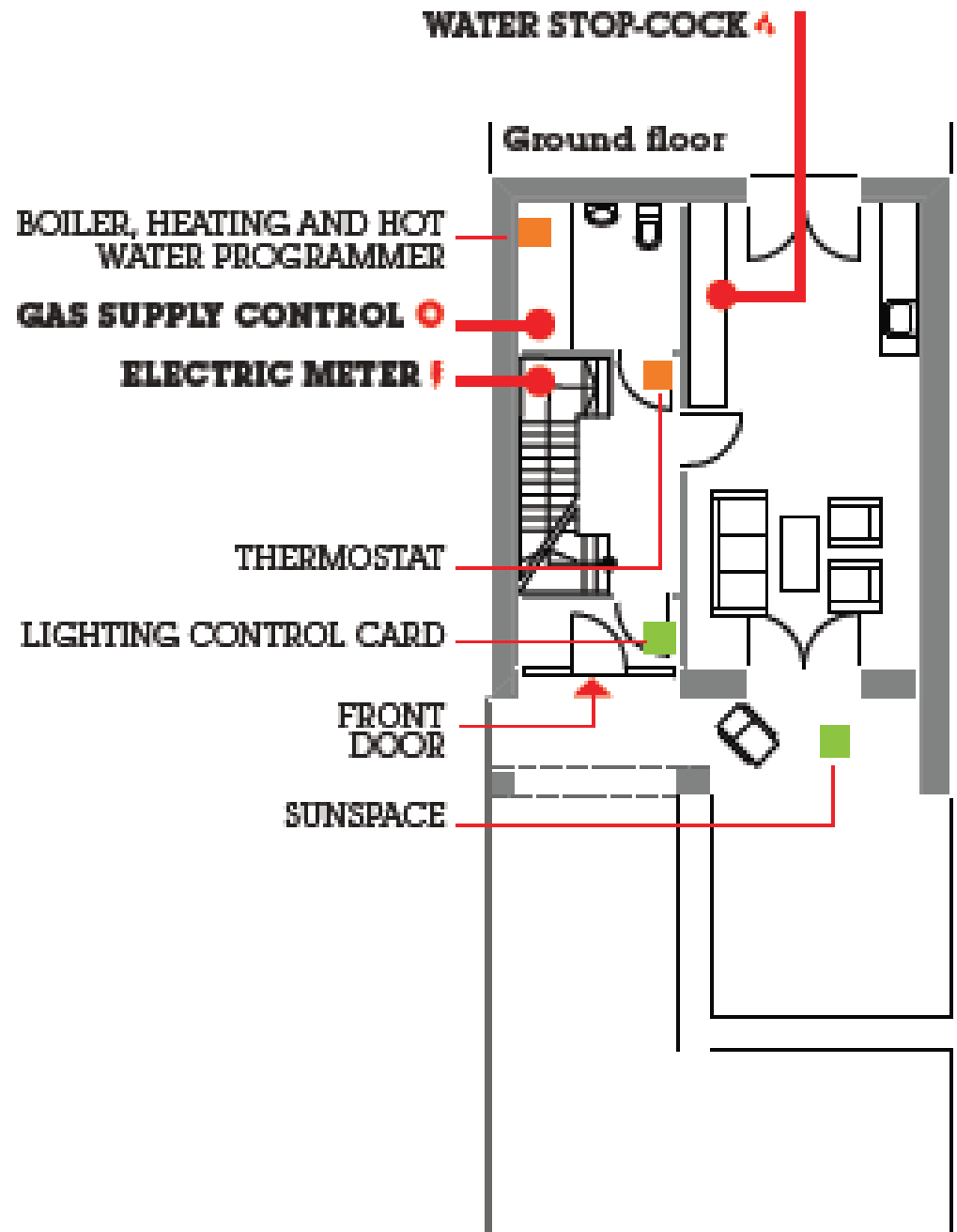
# Better guidance

the bigger the manual, the dumber the building?

guidance needs to be prepared by design team – highly visual

locate all controls in bespoke manner

SBSA Low Carbon Home Guidance



# Maintenance stage...

“I’m sure my  
meter setting is  
right...”



“I’ll not bother  
with the MVHR  
filters....”



# Better maintenance procedures

briefing– build in the requirements for **easy access to all touchpoints**

insist on cleanable windows – **dirt can reduce daylight by up to 30-40%**

consider **maintenance agreements** with rent which include all servicing

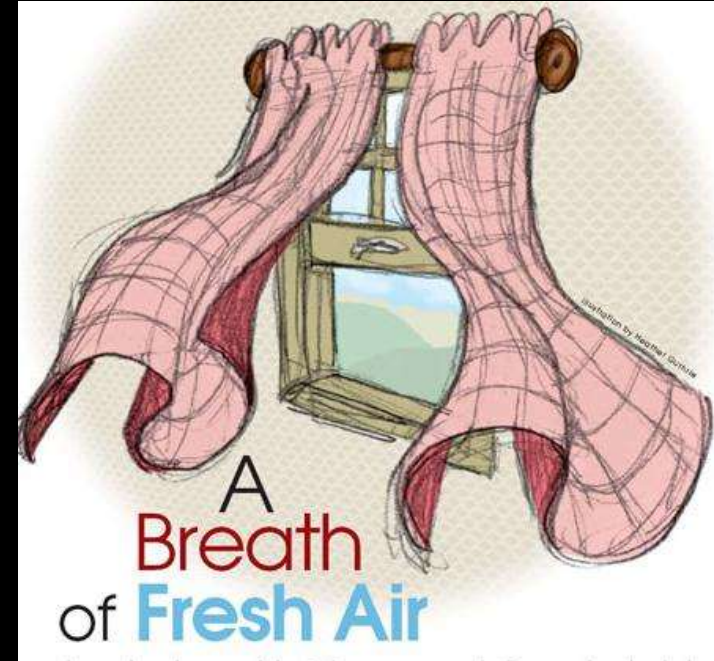
# Design for feedback

Automatic ?

Cognitive ?

Or

Experiential...and empowering



# 4 Key recommendations - users

1. **Robust design and evaluation of products** to take account of user engagement
2. **Clearer labelling**
3. **Clearer guidance and handover procedures**
4. **Show occupants how to use controls optimally** with hands on user experience

# 4 key recommendations – strategic

4. **Ensure usability criteria** are used for briefing, design and specification stages
5. **Detailed and co-ordinated plan for services** in tandem with the design process - focus should be on simplicity of use and access
6. **Training to ensure all parties fully understand new technologies**, including how to install, commission and maintain them
7. **Robust Installation, commissioning and maintenance procedures** –detail requirements in the tender documentation



# Moving on from behaviour to learning

products and buildings which create a relationship with the user – encourage ownership and maintenance

**maximum usability is when emergent properties reveal themselves easily**

e.g. exploring a door handle....

**design for discovery** not 'cover up'

.....**engage** the user



# Habits v learning

user actions become habitual as a strategy for efficient information processing **to protect against information overload**

Jackson2005

**Habits bypass values and motivation**

-highly dependent on the usability of controls

**60 times** before something Becomes a habit.....



# Conclusion

the **usability** of low carbon housing control is highly contingent upon a **complex interaction** between:

procurement processes, user expectations, understanding, experience, habits and **functional ergonomics**.

Thanks for listening...



Anybody know  
how this thing  
works ??