Human Factors in Buildings: Basics

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These are … ?

- **Basic notes** on human factors in buildings, from a measurement perspective.
- Intended as a **pot-boiler** for workshop session.

'Habit is the flywheel of society'.

Chapter heading from The Metronomic Society by Michael Young

Human factors in buildings are …

- A matter of understanding human **need** …
- … using **believable accounts** of behaviour, attitudes and prevailing circumstances.
- **Usually questionnaire surveys will suffice** for data gathering but they may not always be appropriate for every situation.
- **Non-domestic buildings are surveyed differently to domestic**, but many factors are, obviously, common.

Building occupants are happiest when they find …

- Comfortable conditions. Thermal comfort is usually the most important determinant of occupant satisfaction: people often say they are too hot in summer, and can be too cold in winter. Noise is also increasingly a downside.

- Rapid response when things go wrong. People are happier when a perceived need is met quickly, or when they are able to intervene to improve things to their satisfaction.

- Design intentions clearly communicated. People may be more willing to forgive perceived faults if they understand how things are supposed to work.

- Opportunities to escape.

and they they do not like …

- Unmanageable complexity. This applies to all kinds of building user, including facilities managers, and particularly to usability and manageability. People particularly dislike adverse actions of other people or intrusive technology such as apparently arbitrary automatic lighting systems.

- Space layouts which do not support the primary task or action (e.g. teachers who cannot be heard properly by pupils, office workers who are randomly interrupted, noisy neighbours).

- High occupant densities beyond comfort thresholds set by 1-5.

Even better, people like ...

- Situations where they need to intervene to change things only occasionally.
- Opportunities to act quickly to make adjustments if conditions alter.
- Conditions which are ‘good enough’ rather than ‘just right’.

… and they don't like …

- Being prevented from intervening to change physical settings from an undesirable existing state to a better one.
- Being subjected to arbitrary changes in conditions which they are affected by, but cannot then intervene.
- Unfamiliar settings.
- Stressful emergencies.
- Lack of speedy or effective response from other people who control settings which may affect them.
- Being prevented from making trade-offs of their own choosing between lesser evils, e.g. too much noise or too hot?.

Improvement may come from …

- Better physical (designed) device interfaces.
- More appropriate locations for devices and switches.
- Installers' actions supervised.
- Better user familiarity with
  - operating context and
  - design intent.
- Conflict resolution / mediation between different users.
- Altered habits and perceptions, perhaps based on convincing and timely cost and consumption information .

In reality …

- Many usability aspects may appear trivial or low-priority, especially to designers and managers. This can be a tyranny of small decisions for users, many small things adding up to something bigger and undesirable.
- Physical interfaces may be inherited with constraints which are expensive to change especially in older buildings.
  - E.g. positions of meters.
- Installers' actions usually suit their convenience at the time not the users'.
  - E.g. location of switches which should be as close as possible to the point of user need.
- Users may not understand how things are supposed to work or where things are located or how critical they are.
  - E.g. allegedly 'intelligent' systems like lighting, which may operate in exactly the opposite way the user expects.
- Different users will almost always see things differently.
  - E.g. allergy sufferers often want windows closed in summer.
- Habits and behaviours may be acquired and applied willy nilly whatever the circumstances.
  - E.g. windows open or closed (?) in bedrooms at night.

Data-gathering techniques

- Questionnaires are usually best, but must be carefully crafted both for the respondent and the analysis by the researcher.
- Concentrate on needs not wants or wish-lists, and …
- How people actually behave … and
- The factors which are already known to have the greatest effects, e.g. thermal comfort.
- Capture the context as fully as possible.
- Give equal weight to quantitive ratings and qualitative observations.
- Do not take a blunderbuss approach to physical measurement. Measure only where circumstances demand.